Family Exocoetidae

Body oblong or moderately long. Head with vertical sides, ~~sides~~ approximating below. Mouth moderately large, terminal. Jaws not extended in a beak, except in some of very young. Premaxillaries not protractile, with straight transverse front edge. Upper jaw edge chiefly formed by premaxillaries and short maxillaries with lateral edge. Maxillary free from or merely adherent to premaxillary, its edge slipping below front of preorbital. Teeth various, villiform, small or weak. Nostrils large, double, near eye. Gill membranes not united, free from isthmus. Gill rakers variable. Gills 4, slit behind fourth. Vertebrae 44 to 52. Air bladder very large, not cellular, extends far back among haemopophyses from caudal vertebrae. Shoulder girdle and pectoral muscle very strong. Scales Pseudobranchiae hidden, glandular.

deciduous, cycloid, rather large, extend over head. Lateral line low, runs along lower side of body. Dorsal posterior, opposite and similar to anal. No finlets. Caudal forked, lower lobe longer. Pectoral large, inserted high, used as organs of flight. Ventral abdominal, of several soft rays, inserted usually postmedian, occasionally median or pdemedian. Vent close before anal.

Carnivorous and herbivorous fishes living in all warm seas, mostly pelagic, swimming near the surface and skipping or sailing through the air sometimes for considerable distances. They are readily known by their long pectoral fins. In some forms they are not so greatly prolonged (Oxyporhamphus) while in others the ventrals are also prolonged to assist in flight (Cypselurus).

Much discussion as to the flight of these fishes has been published. Their motive power is due to the

action of the strong tail while in the water. The fish suddenly leaping out are planed by their pectorals extended like a parachute rather than as wings, so that the fish may finally fall or slip back into the sea with a splash. Every gradation from the leaping or scuttling along the surface, as with the greek garfish and balaoa, to the most bird like flight may be encountered among these fishes and their allies.

"Much has been written of the flight of the Flying-fish; and we have ascertained, chiefly from Möbius, that it is quite different from the flight of birds or insects or the fluttering of a bat, and more closely resembles the leaping movements made through the air by the Flying Squirrels or the Flying Lizards (Dragons). By the help of the large and strong lateral muscles of the body the fish attains the speed of an arrow, which it maintains above the water, slackening, of course, towards the end, and thus traverses a distance of from 100 to 150 metres through the air in less than 20 seconds. At the same instant as it leaves the surface of the water, the pectoral and ventral fins are expanded. It supports itself principally on the former fins, but almost passively, the wind and pressure of the atmosphere bearing the fish along without any exertion on its own part, save that needed to keep these fins expanded.

There is no independent motion of these fins, according to Möbius; but when the wind blows in a direction exactly parallel to their plane, the hind margin flutters, like the sails of a boat in stays. The Flying-fish cannot steer an independent course, according to Möbius, the direction of its flight being fixed by the impetus once gained; and when the speed slackens, we may see its course changed by the wind, when the latter is not dead ahead, for some seconds before the fish falls back into the waves. According to Möbius the fish is hardly able to rise or descend at will, and when it is seen moving up and down along the waves, this is probably nothing more than the effect of the current of air that rises from the surface, - and is formed in the trough of the waves just as a stream eddies when it passes a promontory, or from the same cause as that from which the flame of a candle is attracted towards

a surface, if we blow straight towards that surface through a tube, the end of which is beside, but behind the candle.

"In many cases fear is probably the first cause of the aerial flight of the Flying-fish; as we have just observed with respect to the Saury, the Flying-fish also seeks refuge in the air from its pursuers, especially the dolphin-fishes (Coryphaena) and Bonitos, or sometimes springs up in terror before the bow of a vessel under way. Often, however, this habit is due to the same instinct that impels the Garpike to leap out of the water as if in sport; and like other fishes that are closely packed in shoals, they often leap in order to escape the crush or to pass one another. They appear on the wing oftener in stormy weather or a steady breeze than in a dead calm. They generally keep only a few feet above the surface; and when they

rise higher, as in the cases where they have fallen on the deck of a vessel as much as 5 metres above the water, this is also due, says Möbius, to the influence of the air-currents. The Flying-fish always come on board on the windward side in a fresh breeze and, in most cases, at night, when in spite of their large eyes they cannot see the ship and aboid it. On the windward side of vessels that have sailed during the night through some part of the ocean where Flying-fish abound, spots of blood and the scales of Flying-fish are often found in the morning; and when the sailors swab the decks, they sometimes come across no small numbers of Flying-fish, a welcome and agreeable change in the seamen's fare. Some of the Flying-fish have thus been dashed against the vessel's side in their rapid flight and killed; but others have been

borne over the bulwarks by the current of air that rushes up the windward side of the vessel, and have fallen on deck." (Smitt.)

Analysis of Genera

a'. Oxyporhamphinae. Pectoral short, not reaching ventral; lower jaw prominent, with symphyseal point, as distinct beak in young.

Oxyporhamphus.

a². Exocoetinae. ~~Teeth on tongue; scales large, less than 40; pectoral moderate; ventral shorter than head.~~ Pectoral longer, reaching dorsal or caudal; lower jaw not prominent.

b'. Teeth on tongue; scales large, less than 40; pectoral moderate; ventral shorter than head. Parexocoetus.

b². No teeth on tongue or vomer, present or absent on palatines; scales more than 40; pectoral longer, nearly reaches caudal.

c'. Ventral much shorter than head, inserted much nearer snout than caudal base.

Exocoetus.

c². Ventral long as or longer than head, inserted much nearer caudal than snout.

Cypselurus.

Genus Oxyporhamphus Gill

Oxyporhamphus Gill, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 273. (Type Hemiramphus cuspidatus Valenciennes, orthotypic.)

Evolantia Smodgrass and Heller, Proc. Washington Acad. Sci., vol. 5, p. 189, 1903. (Type Exocoetus micropterus Valenciennes = Hemiramphus cuspidatus Valenciennes, monotypic.)

Body elongate, well compressed. Head small, rather pointed. Snout short. Eye advanced. Mandible with distinct symphyseal point, protrudes in front; in fry without beak to lower jaw, later formed as temporary beaks of 2 slender persistent rods, these breaking off at an early age to leave finally only spot like scar on chin. Teeth small, conic, pointed, simple, irregularly biserial in jaws and none on palate or tongue. Gill rakers

lanceolate, finely spinescent on front edges. Scales moderate. Lateral line low. Dorsal begins before or opposite anal, subequal with same. Pectoral short, not reaching ventral. Ventral inserted nearer caudal base than eye, broad.

One species. The temporary beak of the young is formed of 2 slender extended rods from the mandible, apparently breaking through the skin, later breaking off and the skin either free as a pair of barbels, also likely temporary or healing at the chin. The beaks form in examples of 20 to 75 mm. in length, or only as sharp mandibular point in very young or fry.

Oxyporhamphus argenteus (F. D. Bennett)

Hemiramphus argenteus F. D. Bennett, Narrative Whaling Voy., vol. 2, p. 269, woodcut, 1840 (type locality: lat. 3° S., lat. 5° N. Pacific Ocean).

— Fowler, Mem. Bishop Mus., vol. 10, p. 78, 1928 (note; compiled).

— Castelnau, Proc. Linn. Soc. New South Wales, vol. 3, p. (355) 394, 1878 (Port Jackson).

Hemirhamphus argenteus Mc Culloch, Fisher New South Wales, ed. 2, p. 31, 1927 (doubts Port Jackson record); Austral. Mus. Mem., ~~vol.~~ no. 5, pt. 1, p. 103, June 29, 1929 (compiled; part).

Oxyrhamphus cuspidatus (Valenciennes)

Hemiramphus cuspidatus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 56, 1846 (type locality: from stomach of bonito taken in East Indies).

Hemirhamphus cuspidatus Gill, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 273 (reference).

Exocoetus micropterus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 127, pl. 563, 1846 (type locality: Port King George, New Holland; Carteret, New Ireland; Buru, Malabar). — Bleeker, Verh. Batavia. Genoot. (Nal. Sch. Bengal. Ind.), vol. 25, p. 72, 1853 (reference); Act. Soc. Sci. Ind. Neerl., vol. 1, no. 5, p. (7) 63, 1856 (Amboina). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 279, 1866 (Amboyna). — Bleeker, Atlas Ichth. Néerl. Ind., vol. 6, p. 77, 1866-72 (Amboina). — Schmeltz, Cat. Mus. Godeffroy, no. 4, p. 253, 1869 (Savay). — Lütken, Videnskb. Meddel. naturh. Foren. Kjöbenhavn, p. 396 (103), 1876 (Atlantic Ocean, lat. 11° N., long. 26° W.; lat. 31° N., long. 76° W.). — Day, Fishes of India, pt. 3, p. 518, 1877. — Macleay, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 185, 1881 (copied). —

Day, Fauna British India, Fishes, vol. 1, p. 429, 1889. — Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 361, 1909 (Indian Archipelago, New Mecklenburg, Hawaii, Hawaiian Islands).

Cyprilurus micropterus Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 128, 1865 (Amboina); Atlas Ichth. Ind. Néerl., vol. 6, pl. (3) 269, fig. 1, 1866-72.

Evolantia microptera Snodgrass and Heller, Proc. Washington Acad. Sci., vol. 5, p. 189, 1903 (lat. 4° N., long. 90° W.). — Jenkins, Bull. Bur. Fisher., vol. 22, p. 434, 1902 (1903) (Honolulu). — Snodgrass and Heller, Proc. Washington Acad. Sci., vol. 6, p. 351, 1905 (copied). — Jordan and Evermann, Bull. Bur. Fisher., vol. 23, pt. 1, p. 130, fig. 44, 1903 (1906) (Honolulu).

— Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 10 (Revillagigedo).

— Fowler and Ball, Bull. Bishop Mus., ~~vol. 10, p. 80, 1928~~ No. 26, p. 8, 1925 (Laysan). — Fowler, Mem. Bishop Mus., vol. 10, p. 80, 1928 (Kingsmills, Phoenix Islands).

Evolantia microptera Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 176, fig. 61, 1922 (unknown locality).

Exocetus laviag Thiollière, Faune Woodlark, p. 205, 1857 (type locality: Woodlark Island).

Hemirhamphus convexus Weber and Beaufort, Fishes Indo Austral. Arch., vol. 4, p. 159, fig. 57 (head), 1922 (type locality: Timor; between Gébé and Fau).

Depth 5 2/3 to 7 in body from snout tip; head 4 1/5 to 4 1/2, width 2 1/4 to 3 1/8. Snout 3 1/2 to 4 1/8 in head from snout tip; eye 3 3/4 to 4, subequal with eye, little greater than interorbital; maxillary reaches 3/4 to eye, length 4 2/5 to 5 in head from snout tip; young 80 to 90 mm with mandibular barbels, which measured beyond lower jaw tip 5 times to caudal base, each side also furnished with well developed broad cutaneous flap; interorbital 3 1/4 to 4, low, nearly or quite level. Gill rakers 8 + 21, 1/2 of gill filaments, which 1 1/2 in eye.

Scales 40 to 44 in median lateral series to caudal base and 3 or 4 more on latter; 7 above lateral line to dorsal origin; 33 or 34 predorsal. Scales with 2 or 3 basal radiating striae, edge scalloped; circuli 30 to 35, more or less complete.

D. I, 12, I or I, 13, I, eighth ray 1 3/4 to 2 in head from snout tip; A. I or II, 10, I to I, 14, I, first branched ray 2 1/2 to 2 3/5; least caudal peduncle 3 3/4 to 4; P. I, 9, fin 1 1/3 to 1 4/5 to ventral or 3 1/4 to 4 1/8 in space from snout tip to caudal base; ventral 1 2/3 to 2 in head from snout tip.

Back brown, sides and below silvery white. Broad gray blue leaden shade or sheen from shoulder to caudal base medially. Iris silvery white. Young with beak black. Dorsal whitish, -dusky -above anteriorly -and posteriorly -above black. Caudal dark brown, whitish in young. Anal white, posteriorly blackish, latter area often more extensive in young. Pectoral whitish, terminally dusky to dark brown. Ventral whitish, hind tips blackish.

India, East Indies, Australia, Melanesia, Polynesia, Hawaii, Revillagigedos. There

is little doubt but that the crude figure and description by Valenciennes for his Hemiramphus cuspidatus is based on a young example of the present species. His specimens were a little over 100 mm. The fins are given as "D. 18; A. 12, etc." The young specimens from Timor and between Gébe and Tau described and figured by Weber as a species of Hemiramphus in 1913 and later named Hemiramphus convexus by Weber and Beaufort appear to be synonymous with the present species.

The following is Bennett's account of Hemiramphus argenteus:

"This fish is chiefly remarkable for possessing a prolongation of the lower jaw, in the form of a slender, black, and pointed bone, similar in form, and apparently in office, to the beak, or rostrum, continued from the upper jaw of the sword-fish.

"Average length of the species 4

inches. Body long and compressed. Colour, uniformly silver-white; iris silvery. Pectoral fin long and slender; dorsal and anal placed far back and opposite each other.

"Taken near the surface of the sea, in lat. 3° S. and 5° N., Pacific Ocean".

Curiously Bennett's figure does not show the beak black, such a conspicuous feature in preserved examples.

11 examples. Jolo, Jolo Island. Electric Light. February 8, 1908. Length 61 to 82 mm. All have complete beaks, black and with black lateral flaps.

19863. Maculabo Island. Electric Light. June 13, 1909. Length 86 mm.

One example. Hogas Point, Panay. February 3, 1908. Length 75 mm. Beak to eye equals rest of head.

One example. Taal Anchorage. Electric Light. February 20, 1909. Length 92 mm. Beak projects beyond snout for space equal to ½ eye.

One example. Tataan Passage. February 20, 1908. Length 116 mm.

D. 56604. Bilatu (town), N. 26° W., 8.7 miles (lat. 0° 22' 30" N., long. 122° 42' 30" E.), Gulf of Tomini, Celebes. November 15, 1909. Length 66 mm (beaks broken).

dorsal deeply notched or divided, rather short, spines 10, last ray prolonged, same also of last anal ray. Anal spines 3. Caudal deeply or moderately forked, upper lobe extended with age. Pectoral elongate, falcate, lower rays not extended.

Analysis of the species

a.[1] Etelinus. Gill rakers $\frac{6}{3+7}$ to $\frac{10 \text{ to } 12}{}$; caudal moderately forked. marshi

a.[2] Etelis. Gill rakers $\frac{10 \text{ to } 13}{6+15}$ to $\frac{14 \text{ to } 17}{}$; caudal deeply forked, lobes produced. carbunculus

U. S. N. M., No. 16000. From stomach of Gannet taken 150 miles south of Rivellagigedos. June 1875. Dr. W. H. Jones.

Holacanthus bispinosus Günther.

Holacanthus bispinosus Günther, Cat. Fish. Brit. Mus., vol. 2, 1860, p. 48 (on Bleeker); p. 516 (Amboyna, New Hebrides and Amboyna). — Günther, Journ. Mus. Godeffroy, Heft band 2-3, 5-6, 1874, p. 51, plate 5-6, fig. C (Hawaii and Tahiti, also above examples). — Bleeker, Atlas Ichth. Ind. Neerl., vol. 9, 1877, p. 60, plate (6) 368, fig. 1 (Amboyna). — Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 378, plate 5-6 (from Pago-Pago example, not description). — Jordan and Seale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 384 (Pago Pago examples). — Weber, Siboga Expedt., band 65, 1913, p. 311 (Banda).

— Steindachner, Abhand. Senckenberg. Gesell., band 25, 1900, p. 421 (Ternate).

Genus Pareyocoetus Bleeker

Pareyocoetus Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 126, 1866. (Type Cyocoetus mento Valenciennes, monotypic.)

Body moderately long, elliptical in cross section, compressed. Snout short, ~~lower jaw not produced.~~ Eye large. Jaws protractile, lower with symphyseal knob projecting beyond upper jaw. Teeth minute, conic, in few rows, in jaws, on vomer, palatines, pterygoids and tongue. Gill rakers lanceolate. Scales large. Lateral line low. Dorsal high, opposite anal.

Anal long as dorsal, lower. Pectoral moderate, not reaching beyond middle of dorsal. Ventral short, not reaching anal, insertion median or little postmedian.

Parexocoetus brachypterus (Richardson)

Exocoetus brachyopterus Richardson, Ichth. China Japan, p. 265, 1846 (type locality: Tahiti). — Steindachner, Denks. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, p. 512, 1900 (Honolulu; Laysan).

Exocoetus brachiopterus (Volander) Valenciennes, Hist. Nat. Poiss., vol. 19, p. 131, 1846 (Tahiti; name in text).

Exocoetus brachypterus Günther, Cat. Fishes Brit. Mus., vol. 6, p. 280, 1866 (China Seas). — Bleeker, Nederl. Tijds. Dierk., vol. 4, p. 149, 1873 (reference). — Streets, Bull. U. S. Nat. Mus., No. 7, p. 75, 1877 (Hawaiian Islands). — Günther, Journ. Mus. Godeffroy, vol. 8,

5620, 5624, 14225, 13328. Caxisigan Island. January 2, 1909. Length 143 to 198 mm.

18834 to 18836. Endeavor Strait, Palawan. December 22, 1908. Length 146 to 170 mm.

139. Endeavor Strait. December 23, 1908. Length 123 mm.

9210. Guntao Island, Palawan. December 20, 1908. Length 198 mm.

9364, 9365. Langao Point, Luzon. June 24, 1909. Length 223 to 224 mm.

5777. Liangа Bay. May 12, 1908. Length 215 mm.

pt. 16, p. 362, 1909 (Pelew Islands; Port Mackay; Tahiti).

Exocaetus brachipterus Elera, Cat. Fauna Filip., vol. 1, p. 576, 1895 (Samar; Borongan).

Parexocoetus brachypterus Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 435, 1902 (1903) (Honolulu). — Snyder, Bull. U. S. Fish Comm., vol. 22, p. 522, 1902 (1904) (off Molokai). — Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 131, pl. 3, 1903 (1905) (Honolulu; Hilo). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 10 (Hawaiian Islands); Copeia, No. 122, p. 82, Nov. 22, 1920 (Hawaii). — Weber and Beaufort, Fishes Indo Austral. Arch., vol. 4, p. 174, fig. 60, 1922 (Timalan;

Ins.; Batavia, Samarang and Panaroekan, Java; Java Sea; Sunda Strait; Makassar, Celebes; between Taw and Gebe; Flores; Timor; Adonare). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 202 (Natal). — Fowler and Ball, Bull. Bishop Mus. 26, p. 8, 1925 (Lahaina, Maui). — Fowler, Mem. — Whitley, Rec. Austral. Mus., vol. 14, no. 1, Oct. 7, p. 10, 1927 (Michaelmas Cay, Queensland).

— Schultz, Publ. Vanderbilt Marine Mus., vol. 1, art. 2, p. 46, 1930 (Ponapé, Carolines; Cebu Harbor). — Fowler, Hong Kong Nat., vol. 3, nos. 3-4, p. 272, fig. 16, Dec. 1932 (Hawaii; Atlantic).

Eyonautes brachypterus Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

Isias; Batavia, Samarang and Panaruksan, Java; Java Sea; Sunda Strait; Makassar, Celebes; between Taw and Gebe; Flores; Timor; Adonare). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1925, p. 202 (Natal). — Fowler and Ball, Bull. Bishop Mus. 26, p. 8, 1925 (Lahaina, Maui). — Fowler, Mem. Bishop Mus., vol. 10, p. 79, 1928 (Honolulu, Lahaina, Maui, Oahu).

— Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 46, 1930 (Ponapé, Carolines; Cebu Harbor). — Fowler, Hong Kong Nat., vol. 3, nos. 3-4, p. 272, fig. 16, dec. 1932 (Hawaii; Atlantic). Eyonautes brachypterus Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

ultramarine, spots somewhat larger on vertical anal than on vertical dorsal. Caudal olive, edges and tip of fin ultramarine. Vertical fins narrowly edged black

? Exocoetus javanicus Van Hasselt, Bull. Sci. Nat. Géol. Férussac, vol. 2, p. 375, 1824 (type locality: Batavia, Java.).

dusky, spines and membranes sulphur yellow; produced rays white. Pectoral dusky hyaline with greenish tinge.

21525. Talisse Island. November 9, 1909. Length 40 mm.

3928. Buki, Bouro Island, Dutch East Indies. December 9, 1909. Length 82 mm.

7727. Buba Island, Gulf of Tomini, Celebes. November 20, 1909. Length 83 mm.

7979. Kodepo and Pasejoyo Islands, Celebes. November 16, 1909. Length 71 mm.

13630. Una Una Road, Binang Buang Island, Gulf of Tomini, Celebes. November 18, 1909. Length 63 mm.

Exocoetus brevipinnis Valenciennes, Hist. Nat. Poiss., vol. 19, p. 123, 1846 (type locality: Carteret Harbor, New Ireland). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 280, 1866 (copied); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 362, 1909 (New Mecklenburg).

Exocoetus mento Valenciennes, Hist. Nat. Poiss., vol. 19, p. 124, 1846 (type locality: Pondicherry). — Bleeker, Verh. Batavia. Genoot. (Amoek.), vol. 24, p. 21, 1852 (Batavia); Nat. Tijds. Nederl. Indië, vol. 3, pp. 718, 722, 1852 (Tandjong Berikat, Banka); vol. 4, p. 133, 1853 (Ternate); Verh. Batavia. Genoot. (Nat. Ech. Bengal. Ind.), vol. 25, p. 72, 1853 (Pondicherry); Nat. Tijds. Nederl. Indië, vol. 20, p. 141, 1859–60

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(Badjoa, Boni). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 281, 1866 (Indian Seas); Fishes of Zanzibar, p. 417 ↑1866 (Zanzibar). — Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 18, 1877 (Pelew Islands). — Day, Fishes of India, pt. 3, p. 520, pl. 131, fig. 9 ↑1877. — Meyer, Anal. Soc. Espan. Hist. Nat. Madrid, vol. 14, p. 39, 1885 (Rubi, New Guinea).

→ ↑ Exocaetus mento Gorgoza, An. Soc. Espan. Hist. Nat. Madrid, vol. 14, p. 73, 1885 (Comprado).

Parexocoetus mento Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 77, pl. ( ) 251, fig. 6, 1866-72 (Java, Banka, Celebes, Ternate). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1905, p. 494, 1905 (Baram, Borneo). — Jordan

(Badjoa, Boni). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 281, 1866 (Indian Seas); Fishes of Zanzibar, 1866 (Zanzibar). — Schmeltz, Cat. Mus. Godeffroy, No. 6, p. 18, 1877 (Pelew Islands). — Day, Fishes of India, pt. 3, p. 520, pl. 131, fig. 9, 1877. — Meyer, Anal. Soc. Espan. Hist. Nat. Madrid, vol. 14, p. 39, 1885 (Rubi, New Guinea).

Exocoetus mento Ogilby, Proc. Linn. Soc. New South Wales, vol. 4, p. 64, 1879 (Solomons).

Pareyocoetus mento Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 77, pl. ( ) 251, fig. 6, 1866-72 (Java, Banka, Celebes, Ternate). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1905, p. 494, 1905 (Baram, Borneo). — Jordan

edges green. From nuchal region
downward behind eye soiled white
bar. Lower portion bluish. Breast dar

and Seale, Bull. Bur. Fisher., vol. 26, p. 9, 1906 (1907) (Cavite). — Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 243, 1907 (1908) (Manila). —

Weber, Siboga Exped., vol. 57, Fische, p. 128, 1913 (between Gebe and Fau).

— Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 267, June 1925 (Durban Bay; Delagoa Bay).

Exocoetus hillianus Gosse, Natural. Sojourn Jamaica, p. 11, 1851 (type locality: Jamaica). — Lütken, Vidensk. Medd. naturh. Foren. Kjöbenhavn, p. 397 (104), 1876 (Honolulu). — Norman, Ann. Mag. Nat. Hist., ser. 9, vol. 9, p. 320, April 1922 (Natal).

Exocoetus rostratus Günther, Cat. Fishes Brit. Mus., vol. 6, p. 280, 1866 (type locality: Hawaiian Islands); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 363, 1909 (type).

Parexocoetus rostratus Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 131, 1903 (copied).

Exocoetus atrodorsalis Günther, Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 67, 1867 (type locality: Cape York); Zool. Record, Pisces, p. 109, 1871. — Macleay, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 188, 1881 (Cape York).

Exocoetus gryllus Klunzinger, Verh. Zool. bot. Gesell. Wien, vol. 21, p. 246, 1871 (type locality: Red Sea).

Parexocoetus mesogaster (not Bloch) Jordan and Meeks, Proc. U. S. Nat. Mus., vol. , p. 47, 1885 (Hawaiian Islands). — Jordan and Evermann, Bull. U. S. Nat. Mus., no. 47, pt. 1, p. 728, 1896 (Hawaiian Islands). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 500 (Hawaiian Islands). — Veale,

Occas. Pap. Bishop Mus., vol. 1, no. 5, p. 17, 1902 (Honolulu). — Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 267, June 1925 (Natal); pt. 2, p. 1022, Oct. 1927 (Fowler's reference).

Depth 4 3/5 to 5; head 4 to 4 1/5, width 2 to 2 1/8. Snout 3 3/4 to 3 4/5 in head from snout tip; eye 2 4/5 to 3, greater than snout, subequal with interorbital; maxillary not quite reaching eye, length 4 in head from snout tip; interorbital 2 4/5 to 3, low, level. Gill rakers 8 + 19, lanceolate.

Scales 38 or 39 in lateral axial series to caudal base; 6 above, predorsal. Scales with 4 or 5 basal radiating striae; circuli fine, complete.

D. II, 9, I; first branched ray 3 3/5 in combined head and body to caudal base; A. I, 11, I or I, 12, I; first branched ray 2 2/5 to 2 1/2 in total head length; ventral 1 1/5 to 1 1/4,

origin midway between snout tip and caudal base; caudal 3 1/2 to 3 3/5 in combined head and body to caudal base; pectoral rays I, 12, fin 1 4/5 to 2, reaches middle of dorsal base.

Back dark neutral gray, below whitish. dorsal white, large blackish blotch anterior and terminal. Lower caudal lobe deep gray medially. Pectoral dusky gray, edge above and below whitish. Ventral and anal white.

Red Sea, Zanzibar, Portuguese East Africa, Natal, India, East Indies, Philippines, China, Queensland, Melanesia, Micronesia, Polynesia, Hawaii. The reference to Exocoetus javanicus Van Hasselt, though without description likely applies to this species. It is said to approach Exocoetus mesogaster Bloch, but differs in the number of dorsal rays.

24140 to 24142. Almango Bay, Burias Island. Gill nets. March 6, 1909. Length 125 to 130 mm.

Three examples. Balayan Bay, Luzon. January 19, 1908. Length 90 to 104 mm.

Two examples. Bolinao, Luzon. Electric light. May 9, 1909. Length 49 to 67 mm.

One example. Caldera Bay. Electric light. February 16, 1908. Length 21 mm.

Three examples. Capulaan Bay, Pagbilao Island. Electric light. February 23, 1909. Length 83 to 89 mm.

9098, 9099. Catbalogan, Samar. April 15, 1908. Length 109 to 125 mm. Six examples.

Jamaica, West Indies, Madeira).

Etelis oculatus Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 449 (compiled). — Steindachner and Doderlein, Denks. Akad. Wiss. Wien, Math. Phys. Klasse, vol. 47, pt. 1, 1883, p. 223 (Nagasaki, Tokyo).

? Labrum anthias Lichtenstein, Descript. Animal., 1844, p. 153. Tropical Pacific.

Etelis coruscans Valenciennes, Comptes Rendus Acad. Sci. Paris, vol. 54, June 9, 1862, p. 1166. Bourbon. — Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 449 (note). — Guichenot, Notes Ile Réunion, vol. 2, 1862, p. 23.

Etelis evurus Jordan and Evermann, Bull. U.S. Fish Comm., vol. 22, 1902 (1903), p. 184. Hilo, Hawaiian Islands. — Snyder, Bull. U.S. Fish Comm., vol. 22, 1902 (1904), p. 527 (Honolulu). — Jordan and Evermann, op. cit.,

7772, 7774 to 7775. Catbalogan. April 17, 1908. Length 113 to 125 mm. Three examples. Cebu. Electric Light. March 13, 1909. Length 40 to 85 mm.

D. 5226.
4413. 1 Corregidor Light, N. 10° E., 10.70 miles (lat. 14° 12' 15" N., long. 120° 32' 24" E.), China Sea. May 4, 1908. Length 155 mm.

Three examples. Iloilo market. March 28, 1909. Length 41 to 72 mm.

Twenty-one examples. Jolo. Electric light. February 7, 1908. Length 93 to 124 mm.

Fifty-two examples. Jolo. February 8, 1908. Length 14 to 139 mm.

One example. Jolo. February 14, 1908. Length 24 mm.

Six examples. Maculabo Island. June 13, 1909. Length 86 to 101 mm.

Etelis carbunculus Cuvier

Etelis carbunculus Cuvier, Hist. Nat. Poiss., vol. 2, 1828, p. 127, pl. 18. Mahé, Seychelles. — Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 79 (Mauritius). — Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 448 (copied). — Playfair, Proc. Zool. Soc. London, 1867, p. 846 (Seychelles). — Guichenot, Hist. Phys. Ile Réunion, vol. 2, 1862, p. 23. — Jordan and Snyder, Annotat. Zool. Japon., vol. 3, 1901, p. 77 (Nagasaki). — Jordan and W. F. Thompson, Proc. U. S. Nat. Mus., vol. 39, 1911, p. 465 (paratypes of Etelis evurus; Havana). — Fowler, Bull. Bishop Mus., No. 22, 1925, p. 26 (Honolulu); Mem. Bishop Mus., vol. 10, 1928, p. 193, pl. 17 A (Honolulu, Hilo, type of Etelis evurus).

Serranus oculatus Cuvier, Hist. Nat. Poiss., vol. 2, 1828, p. 266, pl. 32. Martinique. — Schlegel, Fauna Japonica, Poiss., dec. 1, 1842, p. 5 (Nagasaki Bay).

Anthias oculatus Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 92 (South America,

Six examples. Manila markets. December 12 to 18, 1907. Length 92 to 127 mm.

9079. Manila market. June 24, 1908. Length 104 mm.

Three examples. Masbate, Masbate Island. Electric light. April 20, 1908. Length 22 to 35 mm.

Three examples. Murcielagos Bay, Mindoro. August 20, 1909. Length 75 to 124 mm.

One example. Hasugbu, Luzon. Electric light. January 15, 1908. Length 23 mm.

Two examples. Nogas Point, Panay. February 31, 1908. Length 103 to 123 mm.

5363. Ilon market, Jolo. March 30, 1908. Length 98 mm.

50714 U.S.N.M. Honolulu, Hawaiian Islands. Dr. J.C. Wood. 1889. Length 378? mm. Type of Etelis cus marshi.

52673 U.S.N.M. Hawaiian Islands. Bureau of Fisheries. Length 288 mm.

One example. Philippines. Length 107 mm.

Two examples. Port Langcan, eastern Palawan. April 7, 1909. Length 34 to 38 mm.

One example. Santa Cruz, Marinduque. Electric light. April 23, 1908. Length 19 mm.

11421. Sea off Capones Island. November 23, 1908. Length 157 mm.

D. 5561. Teomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5° 50' 45" E. 121° 1' 15" E.), vicinity Jolo Island. September 19, 1909. Length 25 to 76 mm.

Two examples. Tumindao Island. Electric light. February 25, 1908. Length 58 to 72 mm.

One example. Sandakan Anchorage, Borneo. March 1, 1908. Length 52 mm. Electric light.

D. X, 11, I, third spine 2 1/4 to 3 in total head length, second ray 2 3/4 to 3 1/4; A. III, 8, I, third spine 3 3/4 to 4 1/4, first ray 2 7/8 to 3; caudal 1 4/5 to 1, forked; least depth of caudal peduncle 3 1/8 to 3 1/2; pectoral 1 1/5 to 1 1/4; ventral 1 3/5 to 1 7/8.

Brown, with dull yellowish shades above, sides lighter and whitish below. Fins all pale.

Hawaii. The species is rare and in life, though less brilliant than Etelis carbunculus, and it also has a golden lateral streak. Though Jordan and Evermann give the maximum as 647 mm. the largest I examined was 585 mm.

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U. S. N. M. No. 17986. Honolulu. Dr. J. H. Streets. Length 158 to 170 mm. Two examples.

U. S. N. M. No. 55118. Honolulu. Albatross Collection. June 27, 1902. Length 170 to 180 mm. Six examples.

U. S. N. M. No. 55123. Honolulu. Albatross Collection. April 6, 1902. Seven examples. Length 155 to 180 mm.

U. S. N. M. No. 55432. Honolulu. 1901. Bureau of Fisheries. Length 170? to 178? mm. Five examples.

U. S. N. M. No. 55559. Length 163 to 182 mm. Two examples.

U. S. N. M. No. 58524. Honolulu. E. L. Berndt. Bureau of Fisheries. Length 160 mm.

teeth in jaws, outer row enlarged; band of strong small teeth across vomer and each palatine; interorbital 3 1/6 to 3 1/2, low, level; hind preopercle edge finely denticulate. Gill rakers 6 + 10, of which 3 to 5 above or below rudimentary, lanceolate, subequal with gill filaments or ~~minute~~ less than 1/2 of eye.

Scales 47 or 48 in lateral line with 3 to 5 more on latter; 6 scales above lateral line, 10 to 12 below, 15 to 20 predorsal forward midway in interorbital, 6 or 7 rows on cheek to preopercle ridge. Supra-scapula not serrate.

U.S.N.M. No. 63631. Honolulu. E. L. Berndt. Bureau of Fisheries. Length 160? mm.

U.S.N.M. No. 72564. Batavia, Java. April 2, 1909. D. Bryant and W. Palmer. Length 82 mm.

U.S.N.M. No. 75466. Naha, Okinawa. Albatross Collection 1906. Length 144 to 147 mm. Five examples.

U.S.N.M. No. 76648. Takao, Formosa. Dr. Fred Baker. Length 58 to 70 mm. Three examples. As Cypselurus nigripinnis. dorsal and paired fins terminally blackish.

U.S.N.M. No. 84081. Hawaii. Length 140? mm. Poor.

Etelis marshi (Jenkins)

Etelis(cus) marshi Jenkins, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 452, fig. 21. Honolulu.

Etelis marshi Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, 1903 (1905), p. 240, fig. 100, pl. 17 (Honolulu, Hilo, Kailua). — Fowler, Bull. Bishop Mus., No. 22, 1925, p. 26 (Honolulu); Mem. Bishop Mus., vol. 10, 1928, p. 194, pl. 17 B (Honolulu, type of Etelis(cus) marshi).

Depth 3 1/5 to 3 2/5; head 3 to 3 1/8, width 2. Snout 3 2/5 to 3 3/5 in head from snout tip; eye 3 1/2 to 3 3/4, 1 to 1 1/8 in snout; subegral with interorbital; maxillary reaches 1/2 to 3/4 in eye, expansion 1 3/5 to 1 3/4 in eye, length 2 2/3 to 1 7/8 in head from snout tip; bands of villiform

A. N. S. P., No. 7482. Hawaiian Islands. Dr. J. K. Townsend. Length 148? mm.

A. N. S. P., No. 51339. Madras, India. 1922. Department of Fisheries of Bengal. Length 116 mm.

A. N. S. P., 1 example. Borani, British North Borneo. 1898. Dr. W. H. Furness 3rd. Wistar Inst. Anatomy. Length 126 mm.

A. N. S. P., 2 examples. Natal, South Africa. Mr. H. W. Bell-Marley. Length 128 to 142 mm.

Genus Exocoetus Linnaeus

Exocoetus Linnaeus, Syst. Nat., ed. 10, pt. 1, p. 316, 1758. (Type, Exocoetus volitans Linnaeus, monotypic.)

Exocetus Bonnaterre, Tabl. Ichth., p. 181, 1788. (Type, Exocoetus volitans Linnaeus.)

Exocaetus Lacépède, Hist. Nat. Poiss., vol. 5, p. 401, 1803. (Type, Exocoetus volitans Linnaeus.)

Exocoetus Schlegel, Fauna Japonica, Poiss., pts. 10–14, p. 247, 1846. (Type, Exocoetus volitans Linnaeus.)

Halocypselus Weinland, Proc. Boston Soc. Nat. Hist., vol. 6, p. 385, 1859. (Type, Exocoetus mesogaster (not Bloch) = Exocoetus volitans Linnaeus, orthotypic.)

Body moderately long, cross section partly quadrate, compressed. Head moderate. Eye large. Snout short, blunt. Lower jaw but little projecting. Teeth very small, inconspicuous, present or absent on vomer and palatines, none on pterygoids. Gill rakers lanceolate. Scales rather large. Lateral line low. Dorsal not elevated. Anal opposite dorsal and nearly as long. Pectoral very long, reaches caudal base. Ventral premedian, nearer snout than caudal, short, not reaching anal base.

Exocoetus volitans Linnaeus

Exocoetus volitans Linnaeus, Syst. Nat., ed. 10, pt. 1, p. 316, 1758 (type locality; pelagic in high seas of Europe and America); ed. 12, pt. 1, p. 520, 1766. — Forskål, Descript. Animal., p. XVI, 1775 (Djedda; Mocha). — Gmelin, Syst. Nat. Linn., pt. 1, p. 1399, 1788. — White, Journ. Voy. New South Wales, p. 295, pl. (opposite p. 266), 1790. — Walbaum, vol. 3, p. 49, 1792 (copied). — Forster, Fauna Indica, p. 16, 1795 (on Bloch pl. 67). — Blumenbach, Handb. Naturg., p. 286, 1799. — Lichtenstein, Descr. Animal. Forster, p. 155, 1844 (tropical Pacific). — G. Bennett, Gatherings Nat. Australia, p. 13, 1861 (Australian coast). — Lönnberg, Bih. Svensk. Akad., Stockholm, vol. 22, no. 1, p. 25, 1896 (type specimen). —

Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 500 (Hawaii). — Bryan and Herre, Occas. Pap. Bishop Mus., vol. 2, no. 1, p. 127, 1902 (1903) (Marcus Island).

— Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 435, 1902 (1903) (Honolulu, N. 28° 3' W. 143° 10'). — Snyder, Bull. U. S. Fish Comm., vol. 22, p. 522, 1902 (1904)

(lat. 24° N., long. 151° W.; near Oahu). — Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 132 (not fig. 45), 1903 (1905) (lat. 28° 34' 2" N., long. 143° 10' 5"

— Franz, Abhandl. Bayer. Akad. Wiss., vol. 4, Suppl. band 1, p. 24, 1910 (Yokohama). — Kendall and Radcliffe, Mem. Mus. Comp. Zool., vol. 35, p. 85, 1912 (lat. 0° to 7° S., long. 82° to 102° W.);

and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 177, fig. 62, 1922 (Java; Java Sea;

Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 500 (Hawaii). — Bryan and Herre, Occas. Pap. Bishop Mus., vol. 2, no. 1, p. 127, 1902 (1903) (Marcus Island).

— Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 435, 1902 (1903) (Honolulu, N. 28° 3' W. 143° 10'). — Snyder, Bull. U. S. Fish Comm., vol. 22, pt. 5 22, 1902 (1904)

(lat. 24° N., lng. 151° W.; near Oahu). — Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 132 (not fig. 45), 1903 (1905) (lat. 28° 34' 2" N., long. 143° 10' 5" W.). — Seale, Occas. Pap. Bishop Mus., vol. 4, p. 15, 1906 (Tahiti). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1907, p. 424 (Victoria, Australia); 1910, p. 10 (types of Exocoetus chilensis, Indian Ocean, Hawaiian Islands, Victoria). — Weber, and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 177, fig. 62, 1922 (Java; Java Sea;

ashes or spots
rsal fade dusk
ly anteriorly;
spines pale blu
ainder of fin

olive with scattered dashes or spots
slate. Iris black. Dorsal pale dusky
yellow, lighter than body anteriorly;
terminal portions of spines pale blue
on first 6 spines; remainder of fin

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west of Saleyer). — Fowler, Copeia, No. 122, p. 82, Nov. 20, 1922 (Hawaii). — Fowler and Ball, Bull. Bishop Mus. 26, p. 8, 1925 (Wake Island 180th meridian).

— Fowler, Bull. Bishop Mus., No. 38, p. 7, 1927 (Central Pacific); Mem. Bishop Mus., vol. 10, p. 80, fig. 16 (young), 1928 (Honolulu; between Sunday Island and Tonga; open Pacific; Marcus Island; lat. 10° N. long. 160° W.; off Wake Island; 180th meridian; Hawaiian Islands); Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (lat. 3° S., long. 108° W.; lat. 2° 10' N., long. 86° W.; 100 miles east of Tahiti); Hong Kong Nat., vol. 3, Nos. 3-4, vol. 11, No. 5, p. 319, 1931 (compiled); p. 273, fig. 17, Dec. 1932 (Australia, Polynesia, Hawaii, Atlantic).

Exocetus volitans Bonnaterre, Tabl. Ichth., p. 181, pl. 73, fig. 306, 1788 (Europe; Americas). — Swainson, Nat. Hist. Animals, vol. 2, p. 296, 1839 (on Bloch pl. 398).

Exocaetus volitans Lacépède, Hist. Nat. Poiss., vol. 5, pp. 401, 402, pl. 12, fig. 2, 1803 (all seas). — Jouan, Mém. Soc. Sci. Nat. Imp. Cherbourg, vol. 9, p. 191, 1863 (between New Caledonia and Tahiti). — Elera, Cat. Fauna Filip., vol. 1, p. 576, 1895 (Luzon; Manila; Cebu; Samar).

Exocoetus evolans Linnaeus, Syst. Nat., ed. 12, pt. 1, p. 521, 1766 (type locality: Oceano Hispanico) (on Grenow). —

Gmelin, Syst. Nat. Linn., pt. 1, p. 1400, 1789 (copied). — Walbaum, Artedi Pisc., vol. 3, p. 49, 1792 (copied). — Bloch, Naturg. Ausl. Fische, vol. 9, p. 14, pl. 398, 1795 (Cape of Good Hope). — Shaw and Nodder,

Nat. Miscellany, vol. 12, pl. 446, 1800 (Mediterranean; Atlantic). — Schneider, Syst. Ichth. Bloch, p. 430, 1801 (copied). — Valenciennes, Hist. Nat. Poiss., vol. 19, p. 138, 1846 (Ceylon; Bourbon; Arabia; Minicoi; Carteret; Mauritius; New Zealand; Australia; Tongatabu). — Gray, Cat. Fish Grnow, p. 145, 1854 (Spain; America). — Bleeker, Naturk. Tijdr. Nederl. Indië, vol. 21, p. (51, 56) 76, 1860 (Cape of Good Hope). — Guichenot, Notes Ile Réunion, vol. 2, p. 29, 1862; ser. 2, vol. 2, p. 147, 1866 (Madagascar). — Kner, Reise Novara, Fische, p. 326, 1865 (no locality). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 282, 1866 (Zanzibar, Seychelles; Java; India; China; North Australia).

— Steindachner, Sitzs. Ber. Akad. Wiss.

Wien, math.-nat. Kl., vol. 53, pt. 1, p. 470, 1866 (Port Jackson). — Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 69, 1866-72 (Java). — Jouan, Mém. Soc.

Sci. Imp. Cherbourg, ser. 2, vol. 5, p. 106, 1870 (Seychelles). — Bleeker, Nederl.

Tijds. Dierk., vol. 4, p. 149, 1873 (reference). — Lütken, Vidensk. Medd. naturh. Foren., Kjobenhavn, ~~1876~~, p. 395 (102), 1876 (Gulf of Mexico; St. Barthélemy). — Day, Fishes of India, pt. 3, p. 519, pl. 120, fig. 5, 1877 (Bombay; Andamans). — Macleay, Proc. Linn. Soc. New South Wales, ser. 2, vol. 5, p. 186, 1881 (North Australia). — Pöhl,

Cat. Mus. Godeffroy, no. 9, p. 38, 1884 (South Seas). — Boulenger, Proc. Zool. Soc. London, 1887, p. 666 (Muscat). —

Day, Fauna British India, Fishes, vol.

1, p. 429, 1889. — Savage, Hist. Nat. Madagascar, Poiss.; p. 526, 1891 (reference). — Stead, Fishes of Australia, p. 71, 1906. — Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 363, 1909 (Tahiti; Samoa; Kingsmills).

— Franz, Abhandl. Akad. Wiss. München, Suppl. Band, vol. 4, pt. 1, p. 24, 1910 (Yokohoma). — Weber, Siboga Exped., vol. 57, Fische, p. 124, 1913 (lat. 6° 19' S., long. 119° 52' E.). — McCulloch, Fishes New South Wales, ed. 2, p. 30, pl. 10, fig. 106, 1927. — Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

Exocetus evolans Bonnaterre, Tabl. Ichth., p. 182, pl. 100, fig. 409, 1788 (Mediterranean).

Exocaetus evolans de Vis, Proc. Linn. Soc. New South Wales, vol. 8, p. 451, 1883 (New Britain). — Elera, Cat. Filip. Fauna, vol. 1, p. 57, 1895 (Luzon; Cavite; Santa Cruz).

Halocypselus evolans Jordan and Meek, Proc. U. S. Nat. Mus., vol. , p. 49, 1885 (type of Exocoetus chilensis; Indian Ocean; Hawaii). — Nichols, Ann. Mus. Nouit., No. 94, p. 3, Oct. 19, 1923 (Lucie Island). — Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 268, pl. 10, fig. 7, June 1925 (copied) (Cape Seas).

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Exocoetus splendens Abel, Narr. Voy. China, p. 4, 1818 (type locality: China); [illegible] China, Polynesia). — Vaillé Kent, Great Barrier Reef, pp. 299, 370, 1893 (Queensland). Exocoetus apus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 107, 1846 (type locality: Seas of China near Macao). — Bleeker, Nederl. Tijds. Dierk., vol. 4, p. 149, 1873 (reference). — Chu, Biol. Bull. St. John's Univ., Shanghai, No. 1, p. 87, 1931 (reference).

Halocypselus evolans Jordan and Meeks, Proc. U. S. Nat. Mus., vol. , p. 49, 1885 (type of Exocoetus chilensis; Indian Ocean; Hawaii). — Nichols, Ann. Mus. Nouit., No. 94, p. 3, Oct. 19, 1923 (Lucie Island). — Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 268, pl. 10, fig. 7, June 1925 (copied) (Cape Seas).

→ Exocaetus volans Richardson, Ichth. China Japan, p. 264, 1846 (type locality; Seas of China; Polynesia). — Saville Kent, Great Barrier Reef, pp. 299, 370, 1893 (Queensland).
Exocoetus apus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 107, 1846 (type locality; Seas of China near Macao). — Bleeker, Nederl. Tijds. Dierk., vol. 4, p. 149, 1873 (reference). — Chu, Biol. Bull. St. John's Univ., Shanghai, No. 1, p. 87, 1931 (reference).

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Exocaetus apus Elera, Cat. Fauna Filip., vol. 1, p. 476, 1895 (Luzon; Manila; Davotas).

Exocoetus georgianus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 136, 1846 (type locality: lat. 5° N., long. 92° W.). —

Günther, Cat. Fishes Brit. Mus., vol. 6, p. 279, 1866 (copied). — Lütken, Vidensk. Meddl. naturh. Fören., Kjobenhavn, p. 394, 1876 (between Hawaii and Japan in lat. 31° S., long. 47° E.).

Exocaetus monocirrhus Richardson, Ichth. China Japan, p. 265, 1846 (type locality: Sea of China). — Elera, Cat. Fauna Filip., vol. 1, p. 576, 1895 (Luzon; Cavite; Santa Cruz).

Exocoetus monocirrhus Günther, Cat. Fishes Brit. Mus., vol. 6, p. 279, 1866 (copied). — Bleeker, Nederl. Tijds. Dierk., vol. 4, p. 149, 1873 (reference).

Exonautes monocirrhus Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

Exocoetus chilensis Abbott, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 472 (type locality: Chile).

Exocoetus obtusirostris Günther, Cat. Fishes Brit. mus., vol. 6, p. 283, 1866 (type locality: Cape Verde Islands; India; New Orleans). — Bleeker, Verslag. kon. med. Akad. Wet. Amsterdam, vol. 18, p. 3, 1879 (Shanghai). — Pöhl, Cat. mus. Godeffroy, no. 9, p. 35, 1884 (South Sea). — Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 87, Jan. 1931 (reference).

Halocypselus obtusirostris Nichols and Breder, Amer. mus. novit., New York, no. 561, p. 1, Sep. 16, 1932 (reference).

— Károli, Termesz. Füzetek. Budapest, vol. 5, p. 182, 1881 (Canton).

Exocoetus melanopus Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 1, p. 459, 1868 (type locality: Zanzibar; New Pomerania). — Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 366, 1909 (type; New Pommerania).

Exocoetus speculiger (not Valenciennes) Streets, Bull. U. S. Nat. Mus., no. 7, p. 75, 1877 (Honolulu).

Exocaetus longibarba de Vis, Proc. Linn. Soc. New South Wales, vol. 8, p. 454, 1884 (type locality: New Britain).

Halocypselus borodini Nichols and Breder, Amer. Mus. Novit., New York, no. 561, p. 1, fig. 1, Sep. 16, 1932 (type locality: Mauritius).

depth 4 3/4 to 6 1/5; head 3 2/5 to 4, width 1 4/5 to 2. Snout 3 3/4 to 5 in head from snout tip; eye 2 2/3 to 4 1/8, greatly exceeds snout, 1 1/8 to 1 1/4 in interorbital; maxillary reaches 4/5 to eye, length 3 2/3 to 4 3/4 in head from snout tip; interorbital 2 1/2 to 3 1/5, low, flat. Gill rakers 7 to 9 + 20 to 27, slender, 1 1/4 in gill filaments, which 1 1/4 to 1 2/5 in eye.

Scales 38 to 47 in axial lateral series to caudal base and 3 or 4 more on latter; 7 above, 2 below, 26 to 30 predorsal. Scales with 3 to 5 basal radiating striae; circuli fine, complete.

D. II, 11 to II, 13, first branched ray 2 to 2 1/2 in total head length; A. I, 11 or I, 12, first branched ray 2 1/4 to 2 1/3; least depth of caudal peduncle 3 2/3 to 3 4/5; ventral 1 4/5 to 2, inserted midway between snout tip and last anal ray base; upper caudal lobe 1 2/5 to 1 1/2 in lower lobe, which 3 1/2 to 3 3/5 in rest of fish; pectoral 1 1/3 to 1 2/5,

reaches to or slightly beyond caudal base.

Above olivaceous, tinted with dusky, sides and below silvery white. Iris silvery white. Vertical fins dusky, though anal with basal band, broader in front. Pectoral dark above, lower edges white. Young with 2 dark cross bands and sometimes small barbel at chin.

Widely distributed in most all tropical & warm seas, at the Atlantic, Indian and Pacific Oceans.

One example. D. 5195. Capitancillo Island Light, N., 11.75 miles (lat. 10° 47' N., long. 124° 6' 30" E.), off northern Cebu. April 3, 1908. Length 26 mm.

11420. Sea off Capones Island. Flew on board during evening. November 23, 1908. Length 190? mm.

One example. Jolo. February 7, 1908. Length 81 mm.

U.S.N.M., No. 2501. Lat. 44° 27' N., long. 60° 20' 15" W. (off Nova Scotia). July 7, 1885. Length 245 mm.

U.S.N.M., No. 4809.

Length 175 mm. Very poor condition.

U.S.N.M., No. 50013. Lat. 21° N., long. 116° W. R. E. Snodgrass and E. L. Heller. Length 59 to 200 mm. Four examples. Young with single mandibular barbel 1½ in total head length. As Halocypselus evolans.

U.S.N.M., No. 55171.
Albatross Collection (2492). Length
253 mm.

U.S.N.M., No. 65831. Open Pacific.
Albatross Collection (05809). September
8, 1899. Length 37 mm. No barbels.

U.S.N.M., No. 82243. Hawaiian region,
Pacific Ocean. Carnegie Magnetic Exped.
Dr. J. Hobart Egberts. Length 38 mm.
No barbels.

A.N.S.P., No. 7503. Indian Ocean.
Dr. R. Coates.

A.N.S.P., No. 7457. Hawaiian Islands.
Dr. W.H. Jones.

A.N.S.P., No. 33150. Victoria, Australia.
Mrs. Agnes F. Kenyon.

A.N.S.P., Nos. 43479 and 43480. Flew aboard the "Lumera" in
Sir Ernest Shackleton. the tropics.
J.H. McFadden.

A. N. S. P., Nos. 7498 and 7499. Chile. S. S. Rand. Types of Eyerdes chilensis. Length to mm.

A. N. S. P., Nos. 9458 to 9475. Lat. 10° 25' N., long. 168° 9" W. Dr. W. H. Jones.

A. N. S. P., Nos. 7478 to 7480. Indian Ocean. Dr. R. Coates.

Genus Cypselurus Swainson

Cypsilurus Swainson, Nat. Hist. Animals, vol. 2, p. 296, 1839. (Type Exocoetus nuttallii Le Sueur = Exocoetus furcatus Mitchill, designated by Jordan and Gilbert, Bull. U. S. Nat. Mus., no. 16, p. 380, 1882.)

Cypselurus Lowe, Proc. Zool. Soc. London, vol. 8, 1840 (Jan. 1841), p. 38. (Type Exocoetus nuttallii Le Sueur.)

→ Cheilopogon Lowe, Proc. Zool. Soc. London, vol. 8, 1840 (Jan. 1841), p. 38. (Type Cypselurus pulchellus Lowe, monotypic.)

Cypsiluras De Kay, New York Fauna, Fishes, vol. 3, p. 231, 1842. (Type Exocoetus nuttallii Le Sueur.) (Error.)

Pteronichthys Müller, Archiv Naturg., vol. 9, pt. 1, p. 312, 1843. (Type Exocoetus furcatus Mitchill.)

Exonautes Jordan and Evermann, Rep. U. S. Fish Comm., pt. 21, p. 322, 1895 (1896). (Type Exocoetus exiliens P. L. S. Müller, orthotypic.)

Pteronotus Ogilby, Proc. Roy. Soc. Queensland, vol. 21, p. 13, 1908. (Type Exocoetus cirriger Peters, monotypic.)

spots, one at base and one in middle of membranes, in size about half eye diameter and irregular anteriorly. Soft dorsal with 2 rows anteriorly, irregular on posterior membranes. Caudal black terminally, spots irregular all over fin. Anal dark terminally, with darker of orange wash on rays, but no spots. Pectoral dusky orange, almost spotted at base, a scarlet bar on outside of fleshy base, scarlet in axil. Ventral like anal. Branchiostegal membranes scarlet in front of pectoral. Inside of mouth and its membranes scarlet. Orange about eyes.

Body elongate, mostly compressed. Head moderate or small. Snout blunt. Eyes large, advanced. Teeth very feeble, small or absent, in jaws and sometimes on palate, none on vomer, pterygoids or tongue. Gill openings wide. Gill rakers lanceolate, moderate. Lateral line low. Dorsal little or not very high, begins before or opposite anal. Anal usually shorter than dorsal. Pectoral very long, reaches to or nearly to caudal base. Ventral postmedian, nearer caudal than snout, usually long.

Tropical and subtropical seas.

Cypselurus chloropterus (Valenciennes)

Exocoetus chloropterus Valenciennes,

Hist. Nat. Poiss., vol. 19, p. 109, 1846 (type locality: lat. 30°14' S., long. 44°30' W.). — Bleeker, Naturk. Tijdk. Nederl. Indië, vol. 21, p. 56, 1860 (~~reference~~ Cape of Good Hope). — Gilchrist, Marine Invest. South Africa, p. 153, 1901 (name). — Thompson, Marine Biol. Rep. South Africa, no. 3, p. 92, 1916 (references). — Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 271, June 1925 (on Bleeker).

Snout narrow, short. Eye very large, 2 1/2 in head, equals interorbital, which little concave. D. 13; A. 9. Black above, whitish below. Pectoral pale brown. Ventral colorless. Length 165 mm. (Valenciennes.)

South Atlantic. Valenciennes gives notes from Gay's drawing as the back blue, below silvery, dorsal, caudal and pectorals green, ventrals blue.

Cypselurus japonicus (Franz)

lineatus var.:

Exocoetus japonicus Franz, Abhandl. Bayer. Akad. Wiss. 4. Suppl. Band 4, pt. 1, p. 24, 1910 (type locality: Oyama, Sagami Bay).

Cypselurus japonicus Jordan, Tanaka, Snyder, Journ. College Sci., Tokyo, vol. , p. 108, 1913 (Sagami Bay).

Scales 43 or 44. D. 12; A. 10.
Length 310 to 410 mm. (Franz.)

This imperfectly known nominal form is described as a subspecies of the Atlantic Cypselurus lineatus.

Cypselurus longipinnis (Castelnau)

Exocoetus longipinnis Castelnau, Mem. Poiss. Afrique Australe, p. 64, 1861 (type locality: Agulhas Banks, South Africa). — Gilchrist, Marine Investig. South Africa, p. 152, 1901 (reference). — Thompson, Marine Biolog. Rep. South Africa, no. 3, p. 94, 1916 (references). — Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 271, June 1925 (Agulhas Banks).

Body elongate; head 6 in body. Eye large. Scales very large. D. 12; A. 10; lower caudal lobe over twice upper; pectoral rays 14, fin reaches caudal base, 6 times in total length; ventral rays 6, first ray short, horny, flattened, length 2 1/2 or less in body. Silvery white generally, back gray. Fins yellowish, ventral more whitish. Length upwards of 500 mm. (Castelnau.)

South Africa. Known from Castelnau's imperfect account.

Analysis of Species

a.' Eyonautes. Dorsal and anal opposite or nearly so, branched rays 10 to 12.
b.' No barbel at chin; D. 10 or 11.
c.' Only first pectoral ray simple, second and following ones branched.
d.' Pectoral with distinct hyaline band; lower gill rakers 18. rubescens.
d.^{2} Pectoral without distinct hyaline band; lower gill rakers 19. oxycephalus.
d.^{3} Pectoral uniformly dark, edges and lowermost rays pure white.
e.' Lower gill rakers 15. melanocercus.
e.^{2} Lower gill rakers 22. cribrosus.
c.^{2} First and second pectoral rays simple, third and following ones branched.
f.' Second pectoral ray long as first; ventral origin midway between hind eye edge and caudal base.
g.' Large pale blotch below and subbasally on each pectoral. albimaculatus.
g.^{2} Pectoral without pale subbasal blotch below. rondeletii
f.^{2} Second pectoral ray ½ longer than first ray; ventral origin midway

between third preopercle edge and caudal base. exiliens.

b.² Single barbel at chin; D.13. monocirrhus.

a.² Cyprelurus. Anal origin opposite middle of dorsal base, branched rays 8 or 9.

b.³ Broad white band on caudal fin, bounded by black; pectoral fin black at front of each mandibular ramus, lower rays white. rotundi.

b.² Pectoral darks, with transverse hyaline band; caudal without white spots.

i.¹ Head and body without bars.

j.¹ D. 13; A. 8.; ventral white, medially gray. arcticeps.

j.² D. 14 to 16; A. 9 to 11; terminal half of ventral and posterior half of dorsal black. nigricans.

j.³ D. 13; A. 10 or 11; dorsal and ventral uniformly dusky. altipennis.

i.² Head and body with 6 brown cross bars.

k.¹ D. 13 or 14; scales 55 to 60. furcatus.

k.² D. 10 or 11; scales 48. hexazona.

h.² Pectoral pale above, black below; 2 white spots on lower caudal lobe basally; D. 13; scales 54 to 56. hirundo.

h.[3] Pectoral with rounded dark spots.

l.[1] Mouth without barbels.

m.[1] Predorsal scales 25 to 30.

simus.

m.[2] Predorsal scales 39 or 40.

spilopterus.

l.[2] Two barbels at corner of mouth.

bilobatus.

h.[4] Pectoral without bands or spots.

n.[1] No barbels.

o.[1] Teeth on palatines.

p.[1] Ventral origin nearer gill opening than caudal.

q.[1] D. 8 or 9; scales 42 to 45; dorsal uniformly pale; lower gill rakers 13 to 16. unicolor.

q.[2] D. 10 or 11; scales 48; dorsal with black blotch; lower gill rakers 17. bahiensis.

p.[2] Ventral origin nearer caudal base than gill opening.

opisthopus.

o.[2] No teeth on palate.

r.[1] Depth 5 3/4 to 6 1/2; vertical fins pale; lower gill rakers

q.[1] D. 10 or 11; scales 50; dorsal uniformly pale; lower gill rakers 21. uniformis, lower halbergi.

15. agoo.

r.[2] Depth 5; all fins blackish; lower gillrakers 17. nigripinnis.

r.[3] Depth 4 to 4½; fins not black. brevis.

r.[4] Depth 7; lower gill rakers 18. gilberti.

w.[2] Broad ribbon like or band like barbel at symphysis of lower jaw.

t.[1] Paired fins black, with pale edges. narcissi.

t.[2] Pectoral colorless, triangular black spot at base; ventral black. spilurus.

w.[3] Bifid barbel at chin.

t. Pectoral base and tip black, pale medially; caudal pale, with black basal spot. caudimaculatus.

Cypselurus rubescens (Rafinesque)

Exocoetus rubescens Rafinesque, Amer. Month. Mag. Crit. Review, vol. 2, p. 205, 1818 (type locality: Banks of Newfoundland).

Cypselurus rubescens Fowler and Ball, Bull. Bishop Mus., 26, p. 8, 1925 (off Lisianshy; Laysan; Gardner Island). — Fowler, Mem. Bishop Mus., vol. 10, (1928), p. 82, (Lisianshy, off Laysan; Honolulu; Hawaiian Islands; not Guam specimen); vol. 11, no. 5, p. 319, 1931 (compiled).

Exocoetus speculiger Valenciennes, Hist. Nat. Poiss., vol. 18, p. 94, 1846 (May 1847) (type locality: Friendly Islands; Pacific coast of Central America; Sunda Straits; Mauritius; Indian Ocean; Perou-Banks; Port King George). — Bleeker, Naturk. Tijds. Nederl. Indië, vol. 9, p. (259)-273,

1855 (Siboga); Ann. Soc. Sci. Ind. Neerl., no. 7, vol. 2, p. 8, 1857 (Amboina); vol. 8 (Archt. Sumat.), p. 55, 1857 (name); Nederl. Tijds. Dierk., vol. 3, p. 122, 1865 (Amboina). — Günther, Cat.

Fishes Brit. Mus., vol. 6, p. 286, 1866 (Australia; Amboina). — Bleeker, Versl. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 272, 1868 (Guebe, Moluccas); Atlas Ichth. Ind. Néerl., vol. 6, p. 76, pl. ( ) 251, fig. 4, 1866-72 (Singapore; Amboina). — Hutton, Fishes of New Zealand, p. 55, 1872. — Günther, Cruise of Curaçoa, p. 410, 1873 (Solomons). —

Bleeker, Rech. Faune Madagascar, Poiss. et Van Dam, pt. 4, p. 101, 1874 (Mauritius). — Lütken, Vidensk. Medd. Natur. Foren. Kjöbenhavn, p. 403, 1876 (Indian, Atlantic, Pacific Oceans; Arabian Sea; Honolulu). — Streets, Bull. U. S. Nat. Mus., no. 7,

p. 75, 1877 (Honolulu). — Macleay, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 186, 1881 (copied). — Savage, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (name). — Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 366, 1909 (Samoa; Solomons).

Exonautes speculiger Jordan and Evermann, Bull. U. S. Nat. Mus., no. 47, pt. 3, p. 2836 (reference). — Snodgrass and Heller, Proc. Washington Acad. Sci., vol. 6, p. 352, 1905 (lat. 17°23' N., long. 114°9' W.). — Mc Culloch, Zool. Res. Endeavour, p. 30, 1909-10 (between Port Stephens and Newcastle, New South Wales); Austral. Mus. Mem., no. 5, pt. 1, p. 106, June 29, 1929 (compiled).

Cypsilurus speculiger Kendall and Radcliffe, Mem. Mus. Comp. Zool., vol. 26, p. 253, 1911 (Guam).

1855 (Viboga); Act. Soc. Sci. Ind. Néerl., vol. 2, no. 7, p. 8, 1857 (Amboina); vol. 8 (Acht. Sumat.), p. 55, 1859 (name); Versl. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 272, 1868 (Timbe; Moluccas).—

Cypselurus speculiger Mc Culloch, Fishes of New South Wales, ed. 2, p. 30, 1927.

Exocoetus noveboracensis (not Mitchill) Valenciennes, Hist. Nat. Poiss., vol. 19, p. 100, 1846 (Newfoundland).

Exocoetus evolans (not Linnaeus) Valenciennes, Hist. Nat. Poiss., vol. 19, p. 101, 1846 (Cartaret Harbor; Tongatabu).

Exocoetus roberti Müller and Troschel, Hist. Barbadoes, Schomburgk, p. 675, 1848 (type locality: Barbadoes).

Exocoetus quadriremis Gray, Cat. Fish of Granow, p. 145, 1854 (type locality: Spain; India).

? Exocoetus lamelliger Kner and Steindachner, Sitz. Ber. Akad. Wiss. Berlin, math.-nath. Kl., vol. 54, pt. 1, p. 384, pl. 2, fig. 11, 1866 (type locality: lat. 12° S., long. 33° W.; South Sea). — Schmelty,

Cat. Mus. Godeffroy, No. 3, p. 11, 1866 (Pacific Ocean). — Lütken, Videns. Medd. Naturh. Foren. Kjöbenhavn, p. 405, 1876.

Exocoetus volitans (not Linnaeus) Jordan and Evermann, Bull. U. S. Nat. Mus., No. 47, vol. 1, p. 734, 1896.

Depth 5 4/5 to 6 1/4; head 4 to 4 1/2, width 1 3/5 to 1 7/8. Snout 3 2/3 to 4 in head from snout tip; eye 3 to 3 7/8, subequal to little greater than snout, 1 1/4 to 1 2/3 in interorbital; maxillary reaches 4/5 to or to eye, length 3 3/5 to 4 4/5 in head from snout tip; teeth simple, minute, in very narrow bands in jaws; interorbital 2 1/8 to 2 4/5, broad, slightly depressed or shallowly concave medially. Gill rakers 6 or 7 + 17 to 20, lanceolate, length 1 1/4 to 1 1/3 in gill filaments, which 1 3/5 to 1 7/8 in eye.

Scales 44? to 53 in lateral or axial series to caudal base and 5 or 6 more on latter; 7 or 8 above, 2 or 3 below, 33 to 40 predorsal. Scales with 3 to 5 basal radiating striae, edge scalloped; circuli very fine, complete.

D. $\underline{\underline{I}}$, 9 or $\underline{\underline{I}}$, 10, first branched ray 1 7/8 to 2 3/4 in total head length; A. $\underline{\underline{I}}$, 10 to $\underline{\underline{I}}$, 12, first branched ray 2 1/5 to 3; least depth of caudal peduncle 3 2/3 to 4; pectoral rays $\underline{\underline{I}}$, 13 to $\underline{\underline{I}}$, 17, reaches far as or slightly beyond dorsal and anal though not quite to caudal base; ventral 2 2/3 in total to caudal base, reaches back about far as pectoral tips; lower caudal lobe 3 to 3 2/5

D. II, 24, second spine 4 3/4 in total head length, twentieth ray 1 1/3; A. III, 14, I, third spine 5 1/5, tenth ray 1 2/5; caudal 1 1/3, convexly rounded behind; least depth of caudal peduncle 2; pectoral 1 1/3; ventral 1 2/5.

Body rosy or red, back and sides posteriorly more or less with dusky tint. Fins rosy, vertical narrowly edged with bluish. Dorsal over greater anterior portion sparsely dotted with purplish.

(Bleeker.)

East Indies, Japan. Bleeker had but one example 125 mm. long. His figure shows a blue line from above the nostrils along and around hind eye edge, then forward to middle of upper lip. The muzzle and cheeks are also shown with other parallel blue lines.

in rest of body, lower lobe 1½ in upper lobe.

Back olive brown, sides and below silvery white. Iris silvery white. Vertical fins all more or less pale to whitish, dorsal with black median blotch above. Caudal with dark basal area, lower lobe with dark gray subterminal blotch; tip of upper lobe and all middle of lobe sometimes more or less dusky. Pectoral largely blackish, with rather narrow whitish transverse bar subbasally. Ventral whitish, especially hind border, becomes blackish subterminally.

Arabian Sea, Mauritius, India, Malaya, East Indies, New South Wales, Tasmania, New Zealand, Melanesia, Polynesia, Hawaii.

depth 2 7/8; head 3 1/10, width 1 3/4. Snout 4 (in profile) in head; eye from snout tip 3 3/4, greater than snout; maxillary reaches slightly beyond front eye edge, expansion 1 3/4 in eye, length 2 2/5 in head from snout tip; bands of fine teeth in jaws, with 2 to 4 external curved canines anteriorly; partly semilunar narrow band of fine teeth on vomer; interorbital low.

Scales 6'2 in lateral series to caudal base (figure shows about 57 with 10 more on caudal base); tubular scales (in figure) 42 in upper section of lateral line and 20 in lower section to caudal base; 5 scales above lateral line, 18 below, about 22 predorsal forward over mid nostril, 5 rows on cheek to preopercle ridge. Bases of dorsals, anals and pectorals with four small scales; basal half of caudal with fine scales.

Also the Pacific coasts of South America, the Galapagos and the Atlantic. The young are greatly like those of Cynoscion furcatus in general appearance. They may be known by the larger anal, which begins slightly before the dorsal origin. Also each pectoral marked by a single white transverse bar.

~~1 example.~~ Tataan Passage. February 20, 1908. Albatross Collection. Length 124 mm.

4428. D.5186. Lusaran Light, N. 20° E., 37.80 miles (lat. 9° 53' 30" N., long. 122° 15' 30" E.), between Panay and Negros. March 30, 1908. Length 124 mm.

U.S.N.M. No. 17985. Honolulu. Dr. J. H. Streets. Length 278 mm.

U.S.N.M. No. 42345. Tasmania. A. P. London. Length 260? to 285 mm. Two examples.

trispilos

b.[2] Body with blackish longitudinal lines, sometimes few, ~~absent~~, though never absent.

c.[1] Soft dorsal without black basal blotch.

melanotaenia

c.[2] Soft dorsal with variable black basal blotch, often large. melanostigma

a.[2] ~~Dyilbyina new subgenus. Caudal fin about 2/5 rest of body, coloration uniform.~~ longipinnis ends in median point behind; scales 50 to 55 in median lateral series.

f.[1] Bartschina ~~new~~ subgenus. Caudal less than head in length; two broad dark longitudinal bands. bitaeniata

f.[2] Dyilbyina new subgenus. Caudal greater than head, about 2/5 of body length to caudal base; coloration uniform. longipinnis

Cypselurus oxycephalus (Bleeker)

Exocoetus oxycephalus Bleeker, Natuurk. Tijdsr. Nederl. Indië, vol. 3, p. (740, 747) 771, 1852 (type locality: Macassar; Batavia); vol. 7, p. (227) 228, 1854 (Macassar); Nederl. Tijdsr. Dierk., vol. 3, p. 124, 1866 (Java; Celebes). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 294, 1866 (type; Formosa). — Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 75, pl. (2) 248, fig. 1, 1866-72 (Java; Celebes); Verslt. Akad. Wet. Amsterdam, ser. 2, vol. 7, p. 36, 1873 (Aru Islands). —

Weber, Siboga Exped., vol. 57, Fische, p. 137, 1913 (Macassar).

Exocaetus oxycephalus Elera, Cat. Fauna Filip., vol. II, p. 578, 1895 (Luzon; Manila; Navotas).

Exonautes oxycephalus Ogilby, Ann. Queensland Mus., No. 9, pt. 1, p. 5, 1908 (Torres Straits). — Mc Cullock, Austral. Mus. Mem., No. 5, pt. 1, p. 407, June 29, 1929 (compiled).

Cypsilurus oxycephalus Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 181, 1922 (Batavia; Java Sea; Makassar; Moluccas).

Cypselurus oxycephalus Fowler and Ball, Bull. Bishop Mus., 26, p. 8, 1925 (off Laysan); Mem. Bishop Mus., vol. 10, p. 81, 1928 (off Laysan; Apia; not type of Exonautes gilberti); vol. 11, No. 5, p. 319, 1931 (south-east Papua).

Cypsilurus unicolor (not Valenciennes) Jordan and Veale, Bull. Bur. Fisher., vol. 25, p. 209, fig. 12, 1905 (1906) (south of Samoa; between Sydney and Auckland. Jordan and Dickerson, Proc. U. S. Nat. Mus., vol. 34, p. 607, 1908 (note).

Depth 6; head 4 1/5, width 1 3/4. Snout 3 1/2 in head from snout tip; eye 3 3/5, greater than snout, 1 1/2 in interorbital; maxillary reaches 7/8 to eye, length 4 1/8 in head; teeth minute, simple, conic, hardly evident, form feeble narrow bands; interorbital 2 1/8, bony width 3 1/10, broad, nearly level or only depressed medially. Gill rakers 8+22, lanceolate, slender, 1 2/5 in eye; gill filaments 3/4 gill rakers.

Scales 48 in axial or lateral series to caudal base and 4 more on latter; 7 above, 3 below, 35 predorsal. Scales with 4 basal radiating striae, edge scalloped; circuli very fine, complete.

D. $\frac{I}{=}$, 10, first branched ray about 3.2 in total head length; A. $\frac{I}{=}$, 10, first branched ray 2 9/10; least depth of

caudal peduncle 3 7/8; pectoral rays I, 14, reaches little beyond tips of last dorsal and anal rays, though not quite to caudal base; ventral 1 1/10 in head, reaches 2/3 in anal base.

Back brown, sides and below silvery white. Iris silvery white. Dorsal and caudal brownish. Ventral and anal whitish. Pectoral largely blackish, especially medially and terminally, edges pale.

East Indies, Philippines, Queensland, Polynesia, Hawaii. This species falls with Exonautes though differs from both Cypselurus rubescens and Cypselurus exiliens in having the upper pectoral ray alone simple and the pectoral without a transverse white band. My example also agrees

with white dots. Some examples have the vertical fins uniformly pale, while in others they may be pale with narrow blackish edge all around. many are without a pale median lateral area on each scale of the anterior portion of the body may have a deep brown spot, when the posterior longitudinal dark bands are usually obsolete or absent. The dark blotch at the pectoral origin is variably large, obscure, to very small or absent. Often the greater posterior portion of the body and most all the fish may even be light yellowish. Some pale examples have a blackish basal line all along the soft dorsal.

My examples corresponding to the nominal Cichlops hellmuthii Bleeker are all largely uniform or without connected

largely with Bleeker's figure. It does not show the pectoral with pale or whitish all around, and though the median longitudinal part of the fin blackish on the membranes, when the fin is opened. When retracted it has an entirely different appearance due to the silvery-gray edges of the rays so that the dark color of the fin is largely obscured, except terminally.

One example. Route to Batan. July 21, 1909. Length 201 mm.

neutral black lines inclined backward. Anals deep umber, with some obscure longitudinal darker parallel lines. Caudal deep umber, obscurely mottled with darks, edges pale all around. Paired fins dull brown, with large dusky blotch usually at pectoral origin.

East Indies. Many examples show the middle of the side dull yellowish brown and the tail with 9 or 10 longitudinal deep brown bands, following medianly or alternately the rows of scales. The oblique dark lines on the soft dorsal are quite variable, sometimes even parallel longitudinally with fin margin, or the lower may each end in rather a large blackish blotch — or greater portion of subbasal median extent of fin. The anterior membranes of the soft dorsal may be crowded

Cypselurus melanocercus (Ogilby)

Exocoetus melanocercus Ogilby, Proc. Linn. Soc. New South Wales, vol. 10, pt. 4, p. 123, 1885 (type locality: Middle Harbour, Port Jackson).

Cypsilurus melanocercus Ogilby, Handb. Sydney, p. 124, 1898. — Stead, Fishes of Australia, p. 64, 1906 (New South Wales). — Ogilby, Linn. Queensland Mus., No. 9, pt. 1, p. 5, 1908 (Moreton Bay).

Cypselurus melanocercus Mc Culloch, Fishes New South Wales, p. 30, 1919; ed. 2, p. 30, 1927.

Depth 6½; head 5, width 1 3/4. Snout 3 1/3 in head from snout tip; eye 3 1/3, equals snout, 1 1/4 in interorbital; maxillary reaches 4/5 to eye, length 5

in head from snout tip; teeth small, conic, simple, in bands in jaws, formed of about 4 transverse series; interorbital 2 2/3, broad, very shallowly concave. Gill rakers 8+15, lanceolate, 1 3/4 in gill filaments, which 1 2/3 in eye.

Scales 62 in median lateral or axial series to caudal base and 6 more on latter; 8 above, 3 below, 47 predorsal. Scales with 3 or 4 basal radiating striae and 2 or 3 incomplete auxiliaries, edge scalloped; circuli fine, complete.

D. $\frac{I}{=}$, 12, third ray 1 3/4 in total head length; A. $\frac{I}{=}$, 10, origin at first 2/5 in dorsal base, first branched ray 2 2/3; least depth of caudal peduncle 3 2/3; pectoral rays $\frac{I}{=}$, 13, reaches caudal base;

artistic figures. I am indebted to Barton A. Bean, of the Division of Fishes, for supplying some items of data from the original records of the expedition.

These were made under my supervision

ventral greatly longer than head, reaches base of eighth anal ray; lower caudal lobe 3 2/3 in rest of fish, upper lobe 1 1/2? lower.

Back olive brown, sides and below whitish, evidently silvery white. Iris pale, evidently white. Dorsal and caudal brownish. Anal and ventral whitish, latter medially brownish. Pectoral brown, largely darker or dusky brown submarginally terminally, especially below; lower hind edge of fin whitish, also pale to whitish below and subbasally.

New South Wales.

U.S.N.M. No. 47876. Port Jackson. Australian Museum. Length 196 mm. (caudal tip broken).

Family Pseudochromididae

Body elongate, compressed. Head usually obtuse. Eyes lateral. Mouth moderate; mandible protruding. Maxillary exposed. Teeth uniserial laterally in jaws and outer enlarged row anteriorly; vomer and palatines toothed. Preopercle entire. Gill membranes united or cleft. No pyloric coeca. Air vessel present. Scales moderate, ctenoid or cycloid. Lateral line interrupted or in two sections, the anterior or upper extending high or up near base of dorsal fin. Dorsal single, with few spines anteriorly. Anal spines 3. Caudal rounded or truncate. Pectoral rays branched. Ventrals thoracic, with spine and 5 rays.

Small fishes allied with the serranids but readily distinguished by the reduced

Cypselurus cibrosus (Kner)

Exocoetus cibrosa Kner, Reise Novara, Fische, p. 326, 1865 (type locality: Sydney [alternative name for Exocoetus unicolor (not Valenciennes) Kner]).

Cypselurus cibrosus McCulloch, Mem. Queensland Mus., vol. 5, p. 59, pl. 7, 1916 (off Port Hacking, New South Wales).

Cypselurus cibrosus McCulloch, Austral. Game Fishes. Fishes New South Wales, ed. 2, p. 30, pl. 10, fig. 107 b, 1927.

Exonautes cibrosus McCulloch, Austral. Mus. Mem., vol. 5, pt. 1, p. 106, Jan. 29, 1929 (compiled).

Exocoetus unicolor (not Valenciennes) Kner, Reise Novara, p. 325, 1865 (Sydney). — Jordan, Guide Study Fishes, vol. 1, fig. 226, 1905; vol. 2, p. 213.

Exocoetus davii (not Gill 1863) Ogilby, Austral. Mus. Mem., vol. 20—22, p. 71, 1889 (Lord Howe Island).

Cypselurus randalleti (not Cuvier) Waite, Rec. Austral. Mus., vol. 5, pp. 156, 195, 1904 (Admiralty Islands).

Cypselurus fulvipes Ogilby, Proc. Roy. Soc. Queensland, vol. 21, p. 8, 1908 (type locality: Lord Howe Island).

depth 6 to 7; head 4 4/5, width 2 1/5. Snout 3 4/5 in head from snout tip; eye 2 4/5 to 3 1/4, little greater than snout, equals interorbital; maxillary reaches about 3/4 in snout, length 4 1/2 in head from snout tip; interorbital low, concave. Gill rakers + 19, 1/3 of eye.

Scales 5 2 in lateral series; 7 above lateral line.

D. II, 10, first branched ray 1 7/8 in total head length; A. II, 11, first branched ray 2 1/8; least depth of caudal peduncle 3 1/2; upper caudal lobe 1 2/5 in lower lobe which 3 1/5 in rest of fish; pectoral reaches little beyond depressed dorsal, 1 2/5 in or to caudal base. body length to caudal base, 2

p. 4 (Amboina). — Playfair, Fishes of Zanzibar, 1865, p. 32 (Zanzibar). — Klunzinger, Verh. zool. bot. Ges. Wien, band 20, 1870, p. 775 (Red Sea). — Günther, Journ. Linn. Godeffroy, band 4-5, heft 6-7, 1874, p. 35 (Polynesia). — Weber, Siboga Exped., band 65, 1913, p. 308 (Banda). — Ahl, Arch. Naturges., band 89, abth. A, heft 5, 1923, p. 179 (Galeit, Samoa, South Sea, Mauritius, Zanzibar.

Chaetodon (Megaprotodon) strigangulus Klunzinger, Fische Roth. Meer., 1884, p. 56 (Kosseir).

Megaprotodon strigangulus Bleeker, Atlas Ichth. Ind. Neerl., vol. 9, 1877, p. 54 ~~plate (13) 375, fig.~~ (Batu, Java, Celebes, Timor, Halmahera, Aru, Amboina, Ceram, Banda).

Chaetodon tauvina Cuv. and Garnard, Voy. Uranie, Zool., 1825, p. 379. plate 62, fig. 5.

upper rays simple; ventral 3, inserted slightly nearer gill opening than caudal base.

Ultramarine blue above, silvery below. Upper caudal lobe darker, edges of both lobes paler. Pectorals uniformly dark, edges and lowermost rays pure white. Ventrals light colored, rays either little dusky or white with darker edges. Length 310 mm.

(Gilby, McCulloch.)

New South Wales, Lord Howe Island, Admiralty Island.

Chaetodon trifasciatus Lacep. and Gaimard.

Chaetodon trifasciatus Lacep. and Gaimard, Voy. Uranie, Zool., 1825, p. 378, plate 62, fig. 5. Guam. — Günther, Cat. Fish. Brit. Mus., vol. 2, 1860, p. 5 (copied).

Megaprotodon trifasciatus (Lacep.) Jordan and Veale, Bull. Bur. Fisher., vol. 25, 1905 (1906), p. 336, plate 50, fig. 1 (Apia and Pago Pago). — Snyder, Proc. U. S. Nat. Mus., vol. 42, 1912, p. 510 (Okinawa).

Chaetodontes strigangula Gmelin, Syst. Nat. Linn., 1789, p. 1269 (on Broussonet; plural form; inadmissible).

Chaetodon strigangulus (Solander) Cuvier, Hist. Nat. Poiss., vol. 7, 1831, p. 42, plate 172. Tahiti. — Lay and Bennett, Zool. Beechey's Voy., 1839, p. 60, plate 17, fig. 2 (Tahiti and Byam Martin Island). — Günther, Cat. Fish. Brit. Mus., vol. 2, 1860,

Cypselurus albimaculatus new species

Cypsilurus speculiger (not Rafinesque) Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 253, 1911 (Guam).

Cypselurus rubescens (not Rafinesque) Fowler, Mem. Bishop Mus., vol. 10, p. 82, 1928 (Guam specimen; part); Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (lat. 7° S., long. 124° W.).

Depth 5 2/3 to 5 3/4; head 4 1/5 to 4 1/4, width 1 4/5 to 1 7/8. Snout 3 2/3 to 3 4/5 in head from snout tip; eye 3 1/5 to 3 2/3, equal to or little greater than snout,

1 1/5 to 1 1/4 in interorbital; maxillary reaches 3/4 to eye, length 4 1/3 to 4 1/2 in head from snout tip; teeth very small, simple, conic, in narrow bands in jaws; interorbital 2 1/2 to 2 2/3, broad, slightly depressed medianly. Gill rakers 7+18, lanceolate, 1 1/4 in gill filaments, which 1/2 of eye.

Scales 50 or 51 in lateral line to caudal base and 5 more on latter; 7 above, 2 or 3 below; 39 to 42 predorsal. Scales with 5 basal radiating strial, edge scalloped; circuli very fine, complete.

D. $\underline{\underline{I}}$, 10, first branched ray 2 3/4? to 2 7/8 in total head length; A. $\underline{\underline{I}}$, 10, first branched ray 3 1/8 to 3 1/3?; least depth of caudal pedunc

27997. [D. 5353.] Cape Melville Light, N. 85° E., 16.8 miles (7°50'45" N., 116° 43'15" E.), Balabac Strait. January 1, 1909. Length 193 mm.

29381 and 29382. Cebu market. September 1, 1909. Length 337 to 342 mm.

19959 U.S.N.M. Mauritius. Col. H. Pike. Length 175? to 248? mm. 4 examples.

50661 U.S.N.M. Hilo. Bureau of Fisheries. Length 361 mm. Type of Bowersia nlanla.

3 1/2 to 3 7/8; P. II, 18, fin reaches little beyond base of last dorsal ray though not quite so far as tip; ventral longer than head, reaches penultimate anal ray base; lower caudal lobe 3 1/8? to 3 2/5? in rest of fish, upper lobe 1 1/4 to 1 1/3? in total head length.

Back olive brown, sides and below silvery white. Dorsal and caudal brownish, inner part of each lobe of latter little darker. Anal whitish. Pectoral dusky to blackish brown terminally, with broad whitish basal area below, upper basal area dusky. Ventral pale to whitish, scarcely brown medially.

Diagnosis. Related to Cyprelurus rondeletii in its 2 uppermost

Analysis of the species

a.' Bowersia. Scales 47 to 60 in lateral line to caudal base.

b.' Lower gill rakers 12 or 13. microdon

b.² Lower gill rakers 15 or 16. argyrogrammicus

a.² Pristipomoides. Scales 62 to 70 in lateral line to caudal base.

c.' Lower gill rakers 17 or 18. microlepis

c.² Lower gill rakers 20 or 21. filamentosus

simple pectoral rays, but differs markedly in the presence of a large pale blotch below and subbasally on each pectoral.

Type. — U. S. N. M., No. 65810.

This species also closely resembles (Refine-you) Cypselurus rubescens, and may be further distinguished by its similar markings on the pectoral fin less contrasted, or not so decidedly black and white.

U. S. N. M., No. 65810. Guam. Albatross Collection (A 200). Length 280? mm. As Cypselurus speculiger. Type.

U. S. N. M., No. 89734. Lat. 7° S., long. 124° W. September 7, 1929. Dr. A. K. Fisher. Pinchot Expedition. Length 300? mm. As Cypselurus rubescens.

(alba white + macula spot, with reference to the white pectoral blotch.)

Body compressed, oblong or somewhat elongate. Head compressed, somewhat small. Eye large. Mouth moderate. Canines large or small in jaws; villiform teeth on vomer and palatines, sometimes on tongue. Preopercle finely and feebly serrate, with broad flange. Scales moderate or small. Jaws and front of head naked. Dorsal and anal scaleless, caudal minutely scaled. Lateral line complete. Dorsal continuous, last ray extended like that of anal, spines 10. Anal with 3 spines and 8. rays. Caudal forked. Pectoral falcate, long as or longer than head, lower rays not extended. Ventral rather small.

Indo Pacific and West Indies.

Cypselurus rondeletii (Valenciennes)

Exocoetus rondeletii Valenciennes, Hist. Nat. Poiss., vol. 19, p. 115, pl. 562, 1846 (type locality: Naples; Sicily; Canaries). — Waite, Rec. Austral. Mus., vol. 5, p. 156, 1904 (Lord Howe Island).

Cypsilurus rondeletii Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 193, 1922 (probably East Indies).

Cypselurus rondeletii Fowler and Ball, Bull. Bishop Mus., 26, p. 8, 1925 (at 180th meridian; ~~and~~ Laysan); Fowler, Bull. Bishop Mus., 38, p. 7, 1927 (lat. 6°40' N., long. 171° W.; between Seattle and Honolulu); Mem. Bishop Mus., vol. 10, p. 84, 1928 (at 180th meridian; Laysan); Hong Kong Nat., vol. 3, nos. 3-4, dec. 1932, p. 275 ff, fig. 18 (Polynesia; Atlantic).

Exocoetus brachycephalus Günther, Cat. Fishes Brit. Mus., vol. 6, p. 297, 1866 (type locality: China). — Bleeker, Nederl. Tijds. Dierk., vol. 4, p. 149, (1873) 1874 (reference). — Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 13, p. 157, 1874 (Chefoo). — Lütken, Vidensk. Medd. Naturh. Foren. Kjöbenhavn, p. 405 (110), 1876 (Java).

Length 197 mm.

7270. Tigaro Point, Guinapuridan Bay, Samar Island. July 28, 1909. Length 122 mm.

A1344. Labuan, Basilan Island. December 14, 1909. Length 380 mm.

4752. Liangan Bay. May 11, 1908. Length 120 mm.

6048 and 6049. Little Santa Cruz Island. May 28, 1908. Length 295 to 295 mm.

343. Mabesi Island. April 5, 1909. Length 150 mm.

Exocaetus brachycephalus Lütken, Cat. Fauna Filip., vol. 1, p. 578, 1895 (Luzon; Cavite; Santa Cruz).

Exonautes brachycephalus Jordan and Starks, Proc. U. S. Nat. Mus., vol. 26, p. 539, fig. 2, 1903 (Misaki, Tokyo).
— Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (compiled).

Cypselurus brachycephalus Jordan, Tanaka, Snyder, Journ. College Sci., vol. , p. 107, fig. 84, 1913 (Misaki; Nagasaki).

Exonautes brachycephalus Chu, Biol. Bull. St. John's Univ., no. 1, p. 88, Jan. 1931 (reference).

Cypselurus unicolor (not Valenciennes) Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 209, fig. 12, 1905 (1906) (south of Samoa).

4708. Port Galera, Mindoro. October 27, 1909. Length 67 to 93 mm.

4825. Romblon Harbor. March 25, 1908. Length 66 mm. Dark bars seal brown, interspaces pale olive, become gray below; dark becomes yellow through cadmium. Circumoral band yellow, tinged with cadmium above. Tips of dorsal spines and soft dorsal white, edges of incised spinous membranes black. Anal posteriorly tipped with

depth 5 1/2; head 4 2/5, width 1 3/4. Snout 3 1/2 in head from snout tip; eye 3 1/2, subequal with snout, 1 2/5 in interorbital; maxillary reaches 3/4 to eye, length 4 1/4 in head from snout tip; teeth very feeble, scarcely developed, simple, small, short; interorbital 2 2/3, broad, shallowly concave. Gill rakers 8 + 18, lanceolate, slender, 1 1/4 in gill filaments, which 1 2/3 in eye.

Scales 48 in lateral or axial series to caudal base and 4 more on latter; 7 above, 3 below; 38? predorsal. Scales with 4 or 5 basal radiating striae, edge scalloped; circuli very fine, complete.

D. $\underline{\underline{I}}$, 10, first branched ray 2 in

depth 2 2/3 to 3; head 3 to 3 2/3, width 1 2/3 to 3 1/10. Snout 3 1/2 to 3 2/3 in head from upper jaw tip; eye 3 1/2 to 4 1/4, equals snout in young to 1 1/5 in snout with age, greater than interorbital in young to 1 1/6 in interorbital with age; maxillary reaches eye, little inclined from vertical, expansion 1 1/5 to 2 3/4 in eye, length 2 1/8 to 2 1/2 in head from snout tip; 4 canines in front of each jaw, of which lower lateral pair posterior; teeth in villiform bands in jaws, with outer enlarged series laterally; narrow band of villiform teeth across vomer; interorbital 3 4/5 to 6 in head, convex. Gill rakers 6 + 1 2, cuneate, short.

Tubular scales 53 or 54 in upper section of lateral line, 13 to 18 + 2 or 3 in lower section; 7 or 8 scales above

total head length; D. I, 12, second branched ray 2 1/3; least depth of caudal peduncle 4; pectoral rays II, 17, reaches beyond dorsal and anal tips posteriorly, though not quite to caudal base; ventral much longer than head, not quite reaching far back as tip of last anal ray; lower caudal lobe 3 1/5 in rest of fish, upper lobe 1 2/5 in lower or about long as head.

Brown, little paler below. (evidently discolored dark due to formaline). Fins all more or less brownish. Pectoral largely uniform dark or dusky brown, though its lower and posterior edges whitish.

East Indies, China, Polynesia, Hawaii. The specimen described above seems closer to the account and

lateral line, 19 or 20 below, 28 to 30 predorsal; 9 vertical rows of scales on cheeks. Scales with 14 to 18 basal radiating striae, apical denticles 92 to 100, with single row of basal elements; circuli very fine.

D. II, 25, I, second spine 4 1/8 to 4 3/4 in total head length, twenty third ray 1 1/8 to 1 2/5; A. III, 14, I, third spine 4 1/8 to 4 1/5, twelfth ray 1 1/4 to 1 3/4; least depth of caudal peduncle 1 3/4 to 2 1/3; pectoral 1 1/8 to 1 1/3; ventral 1 1/4 to 1 1/3; caudal 3 to 3 1/8 in combined head and body, convex behind.

Body dusky brown to burnt umber, with dozen oblique brown lines on cheeks. Iris brown. Dorsals deep umber, front of soft fin finely dotted with neutral dusky or blackish anteriorly and greater portion of fin with oblique

figure of Exocoetus rondeletii than any other species. Valenciennes gives D. 11 or 12, A. 11 to 13 "etc." If his figure is faulty as the anal is shown inserted before the dorsal. The pectoral is shown with apparently the 4 uppermost rays all simple; a condition I have never seen in any exocoetid. The ventrals are shown with a dark medial basal area, also evident though not so contrasted in my specimen. Jordan and Seale's figure of Cypselurus unicolor surely is the present species, with appended barnacles, not only in its fin formula but its dark uniform pectoral as well. It clearly shows pectoral rays $\frac{II}{=}$, 15.

Dampiera hellmuthii (Bleeker)

Cichlops hellmuthii Bleeker, Naturk. Tijds. Ned. Indië, vol. 6, 1854, p. 329. Larantuka, Flores.

Cichlops hellmuthii Bleeker, Verh. Kon. Akad. Wet. Amsterdam, 2015, vol. 15, 1875, p. 12, pl. 1, fig. 6 (Alor-major, Flores, Letti, Waigiu); Atlas Schth. Ind. Néerl., vol. 9, 1876-77, pl. (1) 390, fig. 4.

Dampiera hellmuthii Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 189 (on Bleeker).

Though Jordan and Starks have
separated the Japanese form
as Exonautes brachycephalus, their
~~incomplete description~~ figure
and incomplete description do
not reveal any tangible characters
for distinction as may be seen
from the following:

Depth 1 3/5 to 1 2/3; head 3 to 3 1/3, width 1 4/5 to 2 1/8. Snout 2 2/3 to 3 1/10 in head from snout tip; eye 3 1/8 to 3 1/5, 1 to 1 1/5 in snout, 1 to 1 1/4 in interorbital; maxillary 2/5 to 1/2 of snout, 4 to 4 1/8 in head; interorbital 2 1/8 to 3 1/8, broadly convex. Gill rakers 3+9 short pointed, 1/6 of gill filaments, which 1/4 in eye. Scales 48 to 56 between gill opening and caudal base; lateral line 56 to 63 in lateral line to caudal base; 14 scales above lateral line, 32 or 33 below. Scales with 7 to 9 basal radiating striae; apical denticles 48 to 52, with 4 to 6 transverse series of basal elements; circuli fine.

D. XI or XII, 24, I or 25, I, last spine 1 1/2 to 1 7/8 in total head length, eighth ray 1 1/2 to 1 3/4; A. III, 21, I, last spine 1 2/3 to 1 3/4, eighth ray 1 2/3 to 1 4/5; least depth of caudal peduncle 2 3/4 to 3; caudal 1 1/2 to 1 2/3, hind edge slightly convex; pectoral 2 4/5 to 2 7/8 in combined head and body; ventral 2 3/4 to 3.

Head, breast, and front of back and most of spinous dorsal over anterior 2/3 at least, brown. Soft dorsal and back adjacent and down to lateral line also brown, likewise most of anal and caudal. Rest of body, especially side, with angular area upward, below last dorsal spines grayish brown. Paired fins dull

depth 6 1/5; head 4 4/5. Snout 5 4/5 in head; eye 3 1/6, greater than snout; maxillary reached opposite front eye edge, length 4 1/5 in head; interorbital little greater than eye, low, concave medially.

Scales 49 in lateral series; 34 predorsal. Lateral line an conspicuous ridge along lower sides of belly.

D. I, 9, first branched ray about 1 9/10 in head; A. I, 11, first branched ray 3; ~~caudal~~ depth of least caudal peduncle 2 4/5; upper caudal lobe about 1 2/5 in lower, which 3 7/8 in rest of fish; ventral 3 1/5; pectoral 1 2/5, reached opposite base of last dorsal ray; ~~outer half of divided second ray not reaching~~ (truncate) second simple ray 1 2/5

8461. Cagayan Island. March 31, 1909.
Length 156 mm. Head from behind base of front dorsal spine downward to near ventral base dark, nearly blackish, becoming brownish on lower head and breast, with slight olive shade above. Triangular area from behind third dorsal spine to front of ninth and pointing below tail above pectoral base orange. Soft dorsal and anal orange, leaving dusky silvery of side nearly an equilateral triangle above axillary line of side; not separated from same color below which includes all of caudal peduncle and caudal fin. Orange includes all dorsal spines except first 3 and all 3 anal spines; orange shades brilliant in life, become dusky after death - and sides appear white or clear silvery in life. Paired fins dusky,

in fin length (first branched ray).
Clear light brown above, silvery below. dorsal and anal colorless, except small dark brown spot at tips of fifth and sixth rays. Caudal dusky. Pectoral membrane dark brown, uniform, rays of outer side silvery, giving closed fin silvery appearance. Ventral brown, inner and outer ray very light. Length 130 mm.
(Jordan and Starks.)

brownish, more deeply brownish on ventrals submarginally. Iris brownish.

Mauritius, East Indies, Hawaii. It is quite evident Chaetodon zosterBennett is the earliest name available for this species. Though very briefly described the account agrees.

One example (with U.S.N.M. 52348).
Apia, Samoa. Bureau of Fisheries.
~~to~~ Length 270 mm. As Cypsilurus
unicolor.

Dampiera spiloptera (Bleeker)

Cichlops spilopterus Bleeker, Natuurk. Tijds. Ned. Indië, vol. 5, 1853, p. 168. Macassar. — Günther, Cat. Fishes Brit. Mus., vol. 2, 1860, p. 259 (copied). — Bleeker, Verhand. Kon. Akad. Weten. Amsterdam, 20.5, vol. 15, 1875, p. 11, pl. 1, fig. 4 (Celebes, Tangi, Batjan, Waigiu); Atlas Ichth. Ind. Neerl., vol. 9, 1876-77, pl. (1) 390, fig. 4. — Meyer, Anales Soc. Espan. Hist. Nat. Madrid, vol. 14, 1885, p. 28 (north Celebes). — Weber, Siboga Exped., Fische, vol. 65, 1913, p. 265 (Karkaralong Island; Elat, Long Key; Teer, High Key; Pepela Bay, Rotti; Lamakera, Solor).

Cichlops spiloptera Jordan and Richardson, Bull. Bur. Fisher., vol. 27, 1907 (1908), p. 261 (Fuga Island and Calayan).

Dampiera spiloptera Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 189 (copied Bleeker).

Cypselurus exsiliens (P. L. S. Müller)

Exocoetus exsiliens P. L. S. Müller, Ritters C. Linné Natursystems - Suppl., Nüremberg, p. 209, 1776 (type locality: Carolina). — Bleeker, Nederl. Tijds. Dierk., vol. 4, p. 149, 1873 (reference).

Exocetus exiliens Bonnaterre, Tabl. Ichth., p. 181, 1788 (Carolina). — Swainson, Nat. Hist. Animals, vol. 2, p. 296, 1839 (on Bloch pl. 397).

Exocoetus exiliens Gmelin, Syst. Nat. Linn., ed. 1, p. 1400, 1789 (Carolina). — Bloch, Naturg. Ausl. Fische, vol. 9, p. 10, pl. 397, 1795 (Mediterranean; Red Sea). —

Schneider, Syst. Ichth. Bloch, p. 429, 1801 (Carolina). — Steindachner, Verhand. Zool. bot. Ges. Wien, vol. 16, p. 482, 1866 (Hong Kong). — Günther, Ann. Mag. Nat. Hist., ser. , vol. 3, p. 147, 1869 (type specimen).

Exocaetus exiliens Lacépède, Hist. Nat. Poiss., vol. 5, pp. 401, 403 (not pl. 12, fig. 3), 1803 (Arabia; Mediterranean; Rhone; tropics; not Brazil).

Exonautes exiliens Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (reference).

↑ Cypselurus exiliens Fowler, Hong Kong Nat., vol. 3, nos. 3-4, p. 275, Dec. 1932 (Atlantic).

Mastacembelus fasciatus Bleeker, Nederl. Tijds. Dierk., vol. 4, p. 149, 1873 (reference; error).

Cyprinodon fasciatus Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 70, 1866-72 (part: on Richardson)

Cyprinodon nigripennis (not Valenciennes) Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 70, 1866-72 (part: on Richardson)

Exocaetus exiliens Lacépède, Hist. Nat. Poiss., vol. 5, pp. 401, 403 (not pl. 12, fig. 3), 1803 (Arabia; Mediterranean; Rhone; tropics; not Brazil).

Exonautes exiliens Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (reference).

Exocaetus fasciatus Richardson, Ichth. China Japan, p. 265, 1846 (type locality: Sea of China).

Mastacembelus fasciatus Bleeker, Nederl. Tijdz. Dierk., vol. 4, p. 149, 1873 (reference; error).

Exocoetus nigripennis (not Valenciennes) Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 70, 1866-72 (part: on Richardson)

8288. Cammahala Bay, Luzon. Marc
11.1909. Length 323 mm.

7745. Caxisigan Island, Balabac.

depth 4 1/8 to 4 1/4; head 5 1/2 to 5 3/4, width 1 1/3 to 1 2/5. Snout 4 to 4 1/4 in head from snout tip; eye 2 1/4 to 2 2/5, 1 1/6 to 1 1/5 in ~~snout~~ interorbital; maxillary reaches 1/8 in eye, length 2 1/4 to 3 in head from snout tip; interorbital 2 1/8, concave. Gill rakers 7+18, lanceolate, 3/4 of gill filaments, which 1/2 of eye.

Scales 44 or 45 in axial lateral series to caudal base and 5 more on latter; 7 above, 2 below, 30 predorsal. Scales with 4 basal radiating striae, edge scalloped; circuli 17 to 19.

D. II, 10, first branched ray 1 1/2 in total head length; A. I, II, I, first branched ray 1 1/4 to 1 2/5; pectoral reaches anal

8886, 9661, 9662 [2016]. Mabul Island.
September 29, 1909. Length 72 to 85 mm.
Ground color pearl gray, slightly
paler below, crossed by bars slightly
wider above than below, not quite
equal to orbit in widest part and
about equal to interspaces; bars
dark brown, below merging into
orange. Circumoral ring orange, snout
and chin dusky; short stripe of brown
between eyes; ocular bar with orange
below eye, joined at breast immediately
before ventral; short stripes at bases
of branchiostegals; third bar from
third dorsal membrane, fourth from
fifth, fifth from seventh, sixth from
ninth, seventh from tenth, eighth from
behind last dorsal spine crosses base
of caudal peduncle and extended across
anal diagonally forward; short brown

base, fin 1/3 in total length to caudal base, first and second rays simple, former trifle longer, both with rather wide distensible connecting membranes, first ray 2 1/5 in fin; ventral inserted midway between hind eye edge and caudal base, fin extends to caudal base, length 1 3/4 in pectoral.

Brownish above, silvery white below. Belly with 3 blackish cross bands. Black spot on upper part of front dorsal rays, fin otherwise whitish. Anal whitish. Caudal whitish, lower lobe with blackish spot

about 6 transverse teal-brown bands, much narrower than body bands, all more or less broken variable and several of series with appearance of spots; caudal with broad pale uniform border behind. Dorsal teal-brown band crosses iris, which otherwise pale, below much broader than above eye and diffuse. Paired fins and spinous anal white or uniformly pale.

Known from the East Indies and Philippines. Our series shows the species variable in color-pattern, sometimes anterior bands broken or irregular. In small examples a tendency to form small black ocelli at apex of soft dorsal.

about 1/3 its distance from base. Pectoral dusky, edged paler above, with blackish basal, median and terminal areas transversely. Ventral somewhat similar, only basal whitish area larger.

Open tropical seas.

depth 1 3/5 to 1 3/4; head 2 3/4 to 3 1/4, width 1 4/5 to 2. Snout 2 1/2 to 3 1/5; eye 2 2/5 to 2 3/5, slightly longer than snout or interorbital; maxillary reaches opposite front nostril. To eye in young, 3 3/4 to 3 4/5 in head; interorbital 3 3/5 to 3 4/5, broadly convex; preopercular spine along upper edge 2 2/5 to 3 4/5. Gill rakers 4 + 11, robust, lanceolate, 1/3 of gill filaments, which 1/2 of eye.

Scales 33 to 46 between gill-opening and caudal base; 7 or 8 scales above lateral line, 20 or 21 below. Scales with 5 to 7 basal marginal striae; apical denticles 16 to 18, each with long slender rootlet; circuli fine.

D. XIII, 16, I or II, 16, I, last spine 1 1/4 to 1 1/3 in head, fifth ray 1 1/10 to 1 1/4; A. III, 16, I or 17, I, third spine 1 1/3 to 1 2/5, sixth ray 1 to 1 1/6; least depth of caudal peduncle 2 1/6 to 2 1/3; caudal rounded convexly behind, 1 to 1 1/5; pectoral 2 1/2 to 3 1/3 in combined head and body; ventral 2 1/3 to 2 3/4.

General color pale brown, inclining to whitish, especially below. Ten reddish-brown regular transverse bands, wider as interspaces and extending on to soft dorsal and anal. Nine young but 7 transverse reddish-brown regular bands, also equally wide as interspaces. All dark bands slightly broader above. Median reddish-brown front band. Caudal with

U. S. N. P., No. 7494. Lat. 31° 30' N., long. 36° 36' W. Length 70 mm.

U. S. N. P., No. 46276. Atlantic Ocean. C. L. Bonaparte (346). Dr. J. B. Wilson. Length 56 mm.

Holacanthus multifasciatus Smith and Radcliffe.

Holacanthus multifasciatus Smith and Radcliffe,
Proc. U. S. Nat. Mus., vol. 40, 1911, p. 324, fig. 3.
Port Galera, Mindoro, Philippines. (Romblon
Harbor; Mabul Island, Borneo; Buka,
Dodepo and Pasejoyo Islands, Binang
Tinang Island, Gulf of Tomini, Celebes;
Ulai, Buro; Talisse Island, Dutch
East Indies.)

Cypselurus monocirrhus (Richardson)

Exocaetus monocirrhus Richardson, Ichth. China Japan, p. 265, 1846 (type locality: Sea of China). —

Günther, Cat. Fishes Brit. Mus., vol. 6, p. 279, 1866 (copied).

Exonautes monocirrhus Chu, Biol. Bull. St. John's Univ., no. 1, p. 87, Jan. 1931 (reference).

Cypselurus monocirrhus Fowler, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 276, Dec. 1932 (compiled).

Space between snout tip and ventrals not reaching middle of anal. Eye rather large, antero lateral in head; black barbel wrinkled, springs from end of chin, flat or furrowed on surface of membrane between jaws, less than head in length. D. 13; A. 13; pectoral 15, extends little beyond

caudal base; ventral rays 6, inserted midway between snout tip and front portion of anal. Length 57 mm. (Richardson.)

China. Only known from Richardson's description.

1236. Candaraman Island. January 4, 1909. Length 108 mm.

1124 and 1125. Camino Island, near Dalet. June 15, 1909. Length 110 to 111 mm.

11855. Caracaran, Bataan Island. June 8, 1909. Length 90 mm.

9679. Caxisigan, off Balabac. January 2, 1909. Length 55 mm.

252 and 253. Caxisigan. December 29, 1909. Length 96 to 109 mm. [10 11.]

3901
14820. Cebu market. April 4, 1908.
1946
Length 99 mm.

1146. Cebu market. April 6, 1908. Length 100 mm.

546 and 549. Daisy Island. January 6, 1910. Length 53 to 71 mm.

10417 and 10424. East side of Verde Island. July 22, 1908. Length 93 to 98 mm.

1223, 4874, 4875, 19564. Galera Bay, Mindoro. June 9, 1908. Length 63 to 97 mm.

Cypselurus rolandri (Valenciennes)

Exocoetus rolandri Valenciennes, Hist. Nat. Poiss., vol. 19, p. 129, 1846 (type locality: Seychelles [not Tahiti]). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 284, 1866 (Indian Ocean). — Bleeker, Rech. Faune Madagascar, Pollen and Van Dam, pt. 4, p. 101, 1874 (reference).

— Günther, Rep. Voy. Challenger, vol. 31, p. 35, pl. 4, fig. A, 1889 (East Africa). — Sauvage, Hist. Nat. Madagascar, Poiss., p. 487 (526), pl. 49, fig. 4, 1891 (Madagascar).

Cypselurus rolandri Jordan, Tanaka, Snyder, Journ. College Sci., Tokyo, p. 108, 1913 (compiled).

Exocoetus cirriger Peters, Monatsb. Akad. Wiss. Berlin, p. 555, pl., fig. 1, 1877 (type locality: China).

Exonautes cirriger Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (reference).

Cypselurus cirriger Fowler, Hong Kong Naturalist, vol. 3, nos. 3-4, p. 279, fig. 22, Dec. 1932 (copied).

Depth 6 3/4; head 4 3/5. Snout
from mouth tip
3 3/5 in head; eye 3 3/5, 1 in snout;
1 1/2 in postocular; ~~interorbital~~
~~low, flat; jaw~~ maxillary concealed;
front part of each mandibular
ramus with broad, delicate, black,
skinny flaps, edge below fringed
with several cirri, some longer
than others, as long as eye;
interorbital low, flat.

Scales 66 in lateral series
to caudal base and 4 more on
latter; 10 between dorsal and
anal anteriorly.

D. II, 10, fourth branched ray
3 3/5 in length to caudal base;
A. II, third ray 2 1/5 in total
head length; least depth of
caudal peduncle 3 3/4; pectoral

5775. Mahinog, Camiguin Island. August 3, 1909. Length 75 mm.

3923 and 3924. Malapascua Island. March 16, 1909. Length 67 to 71 mm.

529, 1011 to 1014. Mansalay, Mindoro. June 4, 1908. Length 88 to 121 mm.

901 to 904. Maricaban Island. January 20, 1908. Length 86 to 94 mm.

1083. Masbate Reef, Masbate. April 20, 1908. Length 76 mm.

990. Ramgbon, Luzon. January 16, 1908. Length 107 mm.

975 and 3907. Pagapas Point, Luzon. February 20, 1909. Length 81 to 87 mm.

375 to 377. Paluan Bay, Mindoro. December 11, 1908. Length 88 to 105 mm.

397, 398, 21018. Paron Point, Albany Gulf, Luzon. June 21, 1907. Length 97 to 100 mm.

1311 to 1313. Polloc. May 23, 1908. Length 86 to 100 mm.

reaches nearly to hind basal end of dorsal, fin 1 3/5 in length to caudal base; ventral 2 1/3, reaches caudal base, origin midway between hind eye edge and caudal base; upper caudal lobe 1 2/3 in lower which 3 3/4 in rest of fish.

Back greenish, otherwise color largely silvery. Before ventrals 3 broad rose colored transverse bands, another behind ventral, more distinct one across front of anal base. Greater part of dorsal, lower hind half of pectoral and ventrals black. Oblique band across lower caudal lobe and outer half of anal blackish. Length 145 mm, (Günther.)

Seychelles, East Africa, Madagascar, China.

7612 to 7613. Grande Island reef, Subig Bay. January 8, 1908. Length 99 to 109 mm.

441. Galvaney, Luzon. March 9, 1909. Length 101 mm.

192, 803, 804. Langao Point, Luzon Island. June 24, 1909. Length 91 to 108 mm.

333 and 334. Limbones Cove, Luzon Island. February 8, 1909. Length 101 to 105 mm.

1117 and 4876. Little Santa Cruz Island. May 28, 1908. Length 104 to 116 mm.

646 and 647. Lode Bay, Destacado. March 13, 1909. Length 107 to 114 mm.

3593. Mactan Island, Cebu. March 25, 1909. Length 93 mm.

1129. Mactan Cove. April 6, 1908. Length 68 mm.

7444. Maculabo Island. June 14, 1909. Length 116 mm.

Günther's excellent account and figure of this species agrees largely with that of Exocoetus cirriger Peters. His specimen was 138 mm.

Pseudochromis

2.[2] Soft dorsal and anal with most all rays simple; ventral rays simple, elongated. Hematochromis

3
1a. Pseudoplesiopsinal. Scales cycloid; palate edentulous; no dorsal, anal or ventral spines, often many dorsal rays simple. Pseudoplesiops

Cypselurus arcticeps (Günther)

Exocoetus arcticeps Günther, Cat. Fishes Brit. Mus., vol. 6, p. 289, 1864 (type locality: China). — Bleeker, Nederl. Tijdsk. Dierk., vol. 4, p. 149, 1874 (reference).

Exocaetus arcticeps Macleay, Proc. Linn. Soc. New South Wales, vol. 8, p. 278, 1883 (south east New Guinea). — Elera, Cat. Fauna Filip., vol. 1, p. 577, 1895 (Luzon; Cavite; Santa Cruz).

Cypsiluras arcticeps Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 182, 1922 (type).

Cypselurus arcticeps Fowler, Mem. Bishop Mus., vol. 10, p. 82, 1928 (compiled). — Chu, Biol. Bull. St. John's Univ. Shanghai, no. 1, p. 88, Jan. 1931 (reference). — Fowler, Hong Kong Nat., vol. 3, nos. 3–4, p. 277, Dec. 1932 (compiled).

Depth 6; head 4, width 1 1/2. Snout 3 2/3 in head from snout tip; eye 3 2/3, subequal with snout, 1 2/3 in interorbital; maxillary reaches 3/4 to eye, length 3 7/8 in head from snout tip; teeth minute, feeble, in very narrow bands in jaws; interorbital 2 1/2, broad, level. Gill rakers 8 + 16, lanceolate, 1 1/5 in gill filaments, which 1/2 eye.

Scales 43 in median lateral series to caudal base and 4 more on latter, mostly fallen and counts according to pockets; 7 above, 3 2/2 predorsal. Scales with 5 or 6 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 13, first branched ray 1 2/5 in total head length; A. I, 7, first branched ray 2 3/5; least

Bureau of Fisheries. Length 341 mm.

55168 U.S.N.M. Honolulu. Albatross Collection. Length 178 mm.

28195 A.N.S.P. Hawaiian Islands. Bureau of Fisheries (no. 05207). Length 240 mm.

depth of caudal peduncle 3 2/3; P. I, 12, reaches slightly beyond caudal base; ventral reaches back nearly far as tip of last anal ray, fin 2 4/5 in length to caudal base; lower caudal lobe 3 1/5 in rest of body, upper lobe short (broken).

Brown above, sides and below pale, evidently silvery white in life. Iris pale. Dorsal and anal whitish. Caudal with upper lobe pale, lower brown. Pectoral dusky to blackish brown basally, terminally black, separated from bases of lower rays by well contrasted triangular white area, which also somewhat extended forward along upper edge of fin submarginally. Ventral whitish.

East Indies, Philippines, China.

1157

6835. Hong Kong market. October 18, 1909.
Length 240 mm.

75498 U. S. N. M. Hiroshima, Japan.
Jordan and Snyder. Length 166
to 172 mm. 2 examples.

75499 U. S. N. M. Onomichi.
Jordan and Snyder. Length 157 to
164 mm. 2 examples.

75500 U. S. N. M. Kobe. Jordan
and Snyder. Length 173 mm.

A striking species, known by its white wing bars, pale dorsal, anal and ventral, besides its structural characters in combination.

north of Hecker Island. 4390. Lat. 25°10' N., long. 166°20' W. November 3, 1907. Length 170? mm.

pectoral base then to lower edge of caudal pedunicle. Vertical fins and ventrals blackish, other fins pale. Length 115 mm.

Only known from the type No. 55610 U. S. N. M. Urado, Southern Japan. May 10, 1903. Dr. H. M. Smith.

Cypselurus nigricans (Bennett)

Exocoetus nigricans Bennett, Narrative Whaling Voy., vol. 2, p. 287, 1840 (type locality: Atlantic and Pacific lat. N. 5°). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 290, 1866 (Java). — Bleeker, Atlas Ichth. Ind. Neerl., vol. 6, p. 75, 1866–72 (Atlantic lat. 9°50" N., long. 25°5' W., of Paris). —

Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 367, 1909 (Atlantic, Indo-Pacific). — Weber, Siboga Exped., vol. 57, Fische, p. 126, 1913 (Bay of Batjan).

Cypsilurus nigricans Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 183, 1922 (Malacca Straits; Java Sea; Bay of Batjan).

Cypselurus nigricans Fowler, Mem. Bishop Mus., vol. 10, p. 82, 1928 (compiled); vol. 11, no. 5, p. 319, 1931 (compiled).

Exocoetus bicolor Valenciennes, Hist. Nat. Poiss., vol. 19, p. 111, 1846 (type locality: Atlantic). — Schmelty, Cat. Mus. Godeffroy, no. 1, p. 10, 1864 (South Seas); no. 2, p. 9, 1865 (South Seas).

Exocoetus spilopus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 118, 1846 (type locality: La Rochelle; St. Helena; Antilles; Sea of Indies; Arabia; sea west of Luzon; de Witt Land in Australia). — Lütken, Videnskb. Medd. Nat. Foren. Kjöbenhavn, p. 401, 1876 (Indian Ocean).

Depth 5 1/3; head 3 7/8, width 2. Snout 3 1/2 in head from snout tip; eye 3 2/5, greater than snout, 1 1/5 in interorbital; maxillary reaches 4/5 to eye, length 4 1/5 in head from snout tip; interorbital 2 1/2, low, concave. Gill rakers 5+16, lanceolate, 1 4/5 in gill filaments, which 1 7/8 in eye.

Scales 48 in lateral axial series from gill opening to caudal base and 3 or 4 more on latter; 8 above, 30 predorsal. Scales with 4 to 7 basal radiating striae; circuli fine, complete.

D. I, 14, first branched ray 1 1/5 in total head length; A. I, 9, first branched ray 2 1/2; least depth of caudal peduncle 3 2/3; lower caudal lobe 3 1/4 in rest of fish; pectoral 1 1/3, reaches caudal base; ventral 2 3/5, fin origin midway between hind eye edge and caudal base.

Back dusky neutral, with violet reflections. Upper surface of head similar, with distinct violet streak from upper hind edge of eye to

pectoral origin. Sides of head brilliant silvery white and sides of trunk soiled or tinged dusky. Violet tints conspicuous at caudal base and at ventral axil. Iris brilliant violet. Lips dusky. Dorsal largely jet black, paler or soiled dusky gray in front. Upper caudal lobe white, base blackish, lower lobe entirely jet black. Pectoral largely black, axil with violet tinge, only lower edge and median portion of lower rays gray white or whitish. Ventral with outer 4/3 jet black, outer and inner edges of fin whitish, median rays basally gray and this shade extending to black terminal blotch. Anal white, hinder outer terminal part black, in strong contrast.

Tropical Atlantic, Indian and Pacific Oceans. Arabia, Malaya, East Indies, Australia.

U. S. N. M., No. 45466. Sea Isle City, New Jersey. September 14, 1915. E. H. Fox. Length 175 mm.

Cypselurus altipennis (Valenciennes)

Exocoetus altipennis Valenciennes, Hist. Nat. Poiss., vol. 19, p. 109, pl. 560, 1846 (type locality: East Indies; Cape of Good Hope). — Bleeker, Naturk. Tijds. Nederl. Indië, vol. 21, p. 56, 1860 (reference). — Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 270, June 1925 (Algoa Bay; Agulhas Bank).

Exocoetus altipinnis Castelnau, Mém. Poiss. Afrique Australe, p. 64, 1861 (sent from Algoa Bay). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 290, 1866 (copied). — Bleeker, Atlas Ichth. Ind. Neerl., vol. 6, pl. ( )247, fig. 3, 1866-67.

— Day, Fishes of India, Suppl., p. 804, 1888 (copied); Proc. Zool. Soc., London, p. 265, 1888 (Bombay); Fauna British

India, Fishes, vol. 1, p. 430, 1889. — Gilchrist, Marine Invest. South Africa, p. 152, 1901 (reference).

Cypsilurus altipinnis Seale and Bean, Proc. U. S. Nat. Mus., vol. 33, p. 240, 1907 (Zamboanga). — Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 184, 1922 (Java Sea; Red Sea). — Duncker and Mohr, Mitteil. Naturh. Mus. Hamburg, vol. 42, p. 129, 1926 (North Pelew Islands). — McCulloch, Austral. Mus. Mem., No. 5, pt. 1, p. 106, 1929 (compiled).

Cypselurus altipennis Fowler, Mem. Bishop Mus., vol. 10, p. 82, 1928 (between Honolulu and San Francisco).

Exocoetus speculiger (not Valenciennes) Bleeker, Naturk. Tijds. Nederl. Indië, vol. 9, p. 273, 1855.

Exocoetus katoptron Bleeker, Nederl. Tijds. Dierk., vol. 2, p. 115, 1863 (type locality: Siboga, Sumatra). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 289, 1866 (type). — Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 72, 1866-72 (Sumatra). — Günther, Journ. Mus. Godeffroy, vol. 8, pt. , p. 367, 1909 (Sumatra; Samoa).

Exocoetus kataptron Vogt, Naturk. Tijds. Nederl. Indië, vol. 66, p. 180, 1907 (Siboga).

Cypsilurus katoptron Jordan and Seale, Bull. Bur. Fisheries, vol. 25, p. 211, fig. 16, 1905 (1906) (south of Samoa).

Cypselurus katoptron McCulloch, Records Australian Mus., vol. 1, pt. 2, p. 84, 1912. Western

Exocoetus robustus Günther, Cat. Fishes Brit. Mus., vol. 6, p. 289, 1866 (type locality: Australia [Western Australia]). — Macleay, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 187, 1881 (copied).

Depth 5 1/2; head 4, width 1 4/5. Snout 4 in head from snout tip; eye 3 1/10, greatly exceeds snout, 1 1/3 in interorbital; maxillary reaches 4/5 to eye, length 4 1/8 in head from snout tip; teeth not evident; interorbital 2 4/5, wide, shallowly concave. Gill rakers 4 + 17, lanceolate, 1 1/3 in gill filaments, which 1 2/3 in eye.

Scales 41 in median lateral series to caudal base and 4 more on latter; 8 above, 3 below, 33? predorsal. Scales with 4 or 5 basal radiating striae; circuli fine, complete.

D. I, 12, first branched ray 2 in total head length; A. I, 10, first branched

ray 2 4/5; least depth of caudal peduncle 3 2/3; P. I, 13, reaches little beyond base of last dorsal or anal ray though not to tips of either; ventral slightly longer than head, reaches middle of ventral base; lower caudal lobe 3 2/5 in rest of fish, upper lobe 1 1/3? in lower lobe.

Brown on back and upper surface, sides and below silvery white, now stained livid or drab brown. Iris slate or neutral gray, doubtless due to formaline. Dorsal and caudal more or less dusky, especially terminally. Anal and ventral white. Pectoral largely dark or neutral dusky, terminally neutral black, two areas sharply contrasted by oblique whitish bar parallel with hind lower fin edge, which also pale to whitish.

Red Sea, South Africa, India, East Indies, Philippines, Western Australia, Micronesia, Polynesia.

U. S. N. M., No. 58044. Zamboanga. 1906. Dr. E. A. Mearns. Length 168? mm.

A. N. S. P., No. 50732. Between San Francisco and Honolulu. 1920. Dr. H. A. Pilsbry.

Genus Pristipomoides Bleeker

Pristipomoides Bleeker, Nat. Vijdr. Ned. Indie, vol. 3, 1852, p. (574) 575. Type Pristipomoides typus Bleeker, monotypic.

Chaetopterus (not Cuvier 1830) Schlegel, Fauna Japonica, Poiss., dec. 5-6, 1844, p. 78. Atypic. Type Chaetopterus sieboldii Bleeker.

Platyinius Gill, Proc. Acad. Nat. Sci. Philadelphia, 1862, p. 236. Type Mesoprion vorax Poey, monotypic.

Bowersia Jordan and Evermann, Bull. U.S. Fish Comm., vol. 22, 1902 (April 11, 1903), p. 182. Type Bowersia violescens Jordan and Evermann, designated by Jordan, Genera of Fishes, pt. 4, 1920, p. 504; Ulaula Jordan and Thompson, Proc. U.S. Nat. Mus., vol. 39, 1911, p. 459. Type Bowersia ulaula Jordan and Evermann, orthotypic.

Cypselurus furcatus (Mitchill)

Exocoetus furcatus Mitchill, Trans. Liter. Philos. Soc. New York, vol. 1, p. 449, pl. 5, fig. 2, 1815 (type locality: New York). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 286, 1866 (India). — Lütken, Vidensk. Medd. Natur. Foren., Kjöbenhavn, p. 400, 1876 (Indian Ocean). — Day, Fishes of India, pt. 3, p. 519, 1877 (copied); Fauna British India, Fishes, vol. 1, p. 429, 1889. — Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 365, 1909 (Indian Ocean; Tahiti),

Exocoetus nuttallii Le Sueur, Journ. Acad. Nat. Sci. Philadelphia, vol. , p. 10, pl. 4, fig. 1, 1821 (type locality: Gulf of Mexico).

Cypsilurus nuttalii Swainson, Nat. Hist. Animals, vol. 2, p. 296, 1839. (reference) fig.,

Exocoetus dussumieri Valenciennes, Hist. Nat. Poiss., vol. 19, p. 132, pl. 564, 1846 (type locality: Cape of Good Hope).

Exocoetus procne Filippi and Verany, Medit. Nota, p. 10, fig. 5, 18 .

Exocoetus maculipinnis Vinciguerra, Ric. I. Volanta 1, 3 fig. 1 f. 6, 1883

depth 4 3/5 to 5; head 4 1/5 to 4 1/4, width 1 7/8 to 2. Snout 3 4/5 to 4 in head from snout tip; eye 2 3/4 to 3 1/8, greater than snout, 1 1/6 to 1 1/5 in interorbital; maxillary reaches 4/5 or to eye, length 3 7/8 to 4 in head from snout tip; interorbital 2 1/2 to 2 3/5, low, flattened to slightly concave. Gill rakers 5 or 6 + 17 or 18, lanceolate, 1 1/3 in gill filaments, which 2 1/4 in eye; 2 or 3 above and as many below rudimentary.

Scales 50? to 56 in axial lateral series to caudal base and 5 or 6 more on latter; 8 above, 2 below, 34 to 36? predorsal. Scales with 3 or 4 basal radiating striae; circuli fine, mostly complete.

D. $\frac{I,12}{=}$ or I, 13, first branched ray 1 1/5 to 1 1/4 in total head length; A. $\frac{I,8}{=}$, first branched ray 1 4/5 to 2; least depth of caudal peduncle 2 3/4 to 2 4/5; upper caudal lobe 1 1/3 in lower, which 4 1/5 in rest of fish; pectoral 1 2/3, reaches middle of depressed anal; ventral 2 1/3, inserted

midway between front of pupil and caudal base.

Brownish on back and head above, sides and below silvery white. Dorsal and caudal tinged with dusky as 2 or 3 larger dark spots on former fin basally and on latter fin on lower lobe. Anal pale or whitish, with dusky spots at tips of some rays. Pectoral contrasted blackish and white, with broad whitish shade extending from axil obliquely to upper rays near terminal ends, and some rays tipped with whitish. Ventral black, except two outer white rays.

India, Polynesia, also tropical Atlantic.

A.N.S.P., No. 7481. Atlantic Ocean. C. L. Bonaparte (No. 190). Dr. J. B. Wilson. Length 8½ mm.

A.N.S.P., No. 22446. Newport, Rhode Island. Joseph Leidy and Samuel Powell. Length 137 mm.

A.N.S.P., No. 45479. Newport, Rhode Island. Messrs. Lee, Amar and Austin. Length 145 mm.

Cypselurus hexazona (Bleeker)

Exocoetus hexazona Bleeker, Naturk. Tijds. Nederl. Indië, vol. 4, p. 206, 1853 (type locality: Muntok, Banka); Nederl. Tijds. dierk., vol. 3, ~~186~~ p. 118, 1863 (Banka); Atlas Ichth. Ind. Neerl., vol. 6, p. 73, pl. (5) 251, fig. 3, 1866-72 (Banka).

Cypsilurus hexazona Weber and Beaufort, Fishes Indo-Austral. Archip., vol. 4, p. 185, 1922 (compiled).

Depth 4 4/5; head 3 3/4, width 1 1/2. Snout 4 in head from snout tip; eye 2 1/3, greater than snout, about equals interorbital; maxillary reaches opposite front eye edge, length 4 in head from snout tip; interorbital low.

Scales 48 in lateral series.

D. I, 9, first branched ray 2 1/5 in total head length; A. I, 8, first branched ray 3 1/5; least depth of

caudal peduncle 2 2/3; lower caudal lobe 3 1/2 in rest of fish; pectoral rays I, 13, fin reaches middle of dorsal or ~~length~~ 1 4/5 in length to caudal base; ventral rays 6, fin not quite reaching end of anal, origin nearly midway between snout tip and caudal base, length 2 2/5 in body to caudal base.

Above bluish green, sides and below silvery. Body with 6 broad brown transverse bands, first through eye, second close before pectoral, third close behind pectoral, fourth above ventral base, fifth from front of dorsal till before anal, sixth from last dorsal to last anal rays. Vertical fins clear, dorsal with with broad brown edge, anal and

9676. Porongpong Island, Palambanes Group. June 10, 1907. Length 110 mm.

1176. Port Biniaga. January 7, 1908. Length 84 mm.

1235. Port Asupon. March 17, 1907. Length 78 mm.

631 and 970. Port Maricaban. July 21, 1908. Length 97 to 100 mm.

850, 851, 1018. Port Matalvi. November 22, 1908. Length 100 to 102 mm.

635 to 637. Port Tilig. July 15, 1908. Length 94 to 110 mm.

936. Pujada Bay. May 15, 1908. Length 71 mm.

576. Pungao, Mindanao. May 8, 1908. Length 100 mm.

214. Kapurapun Island. June 22, 1907. Length 98 mm.

1232. Babatan Island. November 9, 1908. Length 110 mm.

lower caudal lobe tipped brown. Paired fins brownish or blackish violet, transverse clear band on middle of pectoral. Length 54 mm. (Bleeker.)

East Indies. Weber and Beaufort comment "This is the young stage of some species close to C. altipennis and nigricans, from which it seems to differ in the low number of dorsal rays".

793. Agojo Point, Cataingan Island. June 10, 1909. Length 93 mm.

3; 1138, 1139, 1323. Alibijaban Island, Ragay Gulf, Luzon. March 6, 1909. Length 80 to 104 mm.

952, 1285, 4887. Alimango Bay, Burias Island. March 5, 1909. Length 92 to 102 mm.

921 and 10322. Balibian Bay, Lubang Island. July 17, 1908. Length 82 to 113 mm.

1195 and 1196. Bolalo Bay. December 21, 1908. Length 110 to 111 mm.

783. Bolinao. May 10, 1909. Length 106 mm.

752. Buang Bay, Galoit Island. March 15, 1909. Length 110 mm.

622. Bugsuk Island. January 5, 1909. Length 103 mm.

815 and 816. Busin Harbor, Burias Island. April 23, 1909. Length 75 to 95 mm.

164, 165, 3628, 22792. Busin Harbor. March 8, 1909. Length 50 to 92 mm.

Cypselurus hirundo (Steindachner)

Exocoetus hirundo Steindachner, Verh. zool. bot. Gesell. Wien, vol. 16, p. 482, pl. 6, fig. 2, 1866 (type locality: Hong Kong).

Cypsilurus hirundo Jordan and Starks, Proc. U. S. Nat. Mus., vol. 26, p. 542, 1903 (Wakanoura).

Cypselurus hirundo Jordan, Tanaka, Snyder, Journ. College Sci., Tokyo, vol. , p. 107, 1913 (Wakanoura). — Jordan and Metz, Mem. Carnegie Mus., vol. 6, no. 1, p. 25, 1913 (Fusan). — Chu, Biol. Bull. St. John's Univ., no. 1, p. 88, Jan. 1931 (reference). — Fowler, Hong Kong Naturalist, vol. 3, nos. 3–4, p. 278, fig. (modified), Dec. 1932 (compiled).

Depth 6; head 4 1/4. Snout 3 4/5 in head; eye 3 1/8, greater than snout; maxillary reaches opposite front eye edge, length 3 2/3 in head; interorbital low.

Scales 54 to 56 in lateral series; 8 above, 1 below.

D. IV, 9, first branched ray 1 1/10 in head; A. 10 (9 on figure), third ray 2 1/5; least depth of caudal peduncle 3 3/4; upper caudal lobe 1 1/4 in lower, which 3 3/5 in rest of fish; pectoral rays 14, not quite reaching end of depressed dorsal or 1 1/2 in body to caudal base; ventral ventral rays 6, fin reaching

color of tail. Whitish transverse band across front of caudal peduncle, narrowing down across bases of last anal rays to point. Margins of soft dorsal, anal and caudal whitish, only extreme edge of soft dorsal dark or blackish; same fins all with submarginal line, though on caudal leaving broad gray and white edge, so in young dark transverse band median on fin. Caudal basally dark brown with median dark gray band before dark transverse one. Paired fins pale to whitish.

Red Sea, East Indies, Polynesia. A very deep species with dark coloration and many transverse lines. The color-pattern is quite constant.

hind end of depressed anal, length 2 3/4 in body to caudal base, origin little nearer caudal base than hind eye edge.

Contrasted dark and whitish, especially fins, which all with more or less blackish, basally pale or whitish. Caudal with base of upper lobe pale and 2 large rounded whitish spots on lower lobe. Belly blackish.

Length of figure 185 mm.

(Steindachner.)

China.

Depth 1 1/4 to 1 1/3; head 2 2/3 to 3, width 2 1/5 to 2 1/2. Snout 2 4/5 to 3 in head; eye 3 to 3 2/5, 1 to 1 1/6 in snout, greater than interorbital; maxillary 1/2 to 3/5 in snout, 3 7/8 to 4 1/4 in head; interorbital 4 to 4 1/2, convex; gill rakers 5+11, short points, 1/8 of gill filaments, which 1 2/3 in eye.

Scales 30 to 33 between gill opening and caudal base; tubes 17 to 19 in lateral line; 7 or 8 scales above lateral line, 18 or 19 below. Scales with 8 to 12 basal radiating striae, with 1 to 6 auxiliaries incomplete; apical denticles 8 to 14, transverse basal elements in 11 or 12 series; circuli fine.

D. XI, 22, I to 24, I, last spine 1 1/4 to 1 1/2 in head, fourth ray 1 to 1 1/8; A. III, 20, I or 21, I, third spine 1 1/2 to 1 3/4, sixth ray 1 1/4 to 1 1/3; least depth of caudal peduncle 2 3/4 to 3; caudal 1 2/5 to 1 1/2, hind edge straight; pectoral 1 1/8 to 1 1/5; ventral 1 to 1 1/6.

Dark brown, paler or light brown over greater antero-median region. Head, predorsal and breast with 3 parallel bands of blackish-brown arched forward, median through eye, with 3 equally broad white bands separating. Sides with about dozen parallel wide-angled lines, angle forming at median axis, posterior lines closer and becoming diffused in dark

Cypselurus simus (Valenciennes)

Exocoetus simus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 105, 1846 (type locality: Hawaii). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 296, 1866 (copied); Rep. Voy. Challenger, vol. 31, pt. 2, p. 37, 1888 (Honolulu); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 369, 1909 (Hawaiian Islands).

Cypsilurus simus Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 435, 1902 (1903) (Honolulu). — Snyder, Bull. U. S. Fish Comm., vol. 22, p. 522, 1902 (1904) (Honolulu; Kauai; Molokai). — Evermann and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 58 (Bacon, Bulan, Philippines). — Seale, Philippine Journ. Sci., vol. 9, p. 60, 1914 (Hong Kong).

— Jordan and Evermann, Bull. Bur. Fisher., vol. 23, pt. 1, p. 134, fig. 46, 1903 (1905) (Honolulu).

Cypselurus simus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 15 (Honolulu); Copeia, no. 122, p. 82, Nov. 20, 1922 (Hawaii); Bull. Bishop Mus. 26, p. 9, 1925 (Lahaina, Maui; Johnston Island); Mem. Bishop Mus., vol. 10, p. 85, 1928 (Honolulu; Tahiti; Lahaina; Johnston Island). — Borodin, Bull. Vanderbilt Marine Mus., vol. 1, art. 2, p. 46, 1930 (Pollor Harbor, Philippines).

— Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1929, p. 603 (Hong Kong); Mem. Bishop Mus., vol. 11, no. 5, p. 319, 1931 (compiled). — Chu, Biol. Bull. St. John's Univ., Shanghai, no. 1, p. 88, Jan. 1931 (reference). — Fowler, Hong Kong Nat., vol. 3, pt. 4, Nov. 3-4, p. 276, fig. 9, Dec. 1932 (Hong Kong, Melanesia, Polynesia, Hawaii).

Exocetus poecilopterus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 112, pl. 561, 1846 (type locality: New Britain). — Bleeker, Naturk. Tijds. Nederl. Indië, vol. 3, pp. 231, 249, 1852 (Moluccas). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 291,

1866 (Formosa). — Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 74, pl. 5, fig. 5 (copied), 1866-72 (Banda). — Day, Fishes of India, pt. 3, p. 518, pl. 120, fig. 4, 1877 (part); Fauna British India, vol. 1, p. 430, fig. 138, 1889 (part). — Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 369, 1909 (New Pommerania).

Exocaetus paecilopterus Elera, Cat. Fauna Filip., vol. 1, p. 577, 1895 (Luzon; Cavite; Santa Cruz).

Cypsilurus poecilopterus Jordan and Starks, Proc. U. S. Nat. Mus., vol. 26, p. 542, 1903 (Hakodate). — Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 210, fig. 14, 1905 (1906) (off western Tutuila). — Kendall and Radcliffe, Mem. Mus. Comp. Zool., vol. 35, p. 86, 1912 (lat. 18°47.1' S, long. 89°

26' W.). — Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 186, fig. 63, 1922 (Flores). — Anonymous, Ill. Jap. Aquat. Pl. Animals, vol. 1, pl. 21, fig. 1, 1931.

Cypselurus poecilopterus Snyder, Proc. U. S. Nat. Mus., vol. 42, p. 409, 1912 (). — Fowler and Ball, Bull. Bishop Mus., 26, p. 8, 1925 (Johnston Island); Mem. Bishop Mus., vol. 10, p. 83, 1928 (Samoa; Johnston Island).

Exocoetus alatus (Solander) Valenciennes, Hist. Nat. Poiss., vol. 19, p. 113, 1846 (type locality: Tahiti).

Exocoetus neglectus (not Bleeker) Steindachner and Döderlein, Denks. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, pt. 1, p. 512, 1900 (Honolulu).

Depth 4 7/8 to 5 1/4; head 3 4/5 to 4 1/8, width 1 2/3 to 1 3/4. Snout 4 1/8 to 4 1/5 in head from snout tip; eye 3 to 3 1/3, greater than snout, 1 1/4 to 1 3/5 in interorbital; maxillary reaches 3/4 to 4/5 to eye, length 4 1/4 to 4 2/3 in head from snout tip; teeth minute, simple, conic, in narrow bands in jaws; interorbital 2 1/4 to 2 1/3, broad, little depressed medially. Gill rakers 6 + 15, lanceolate, 1/2 gill filaments, which 1 4/5 in eye.

Scales 40 to 52 in lateral or axial series to caudal base and 5 or 6 more on latter; 8 to 10 above, 3 below, 32 to 36 predorsal. Scales with 5 basal radiating striae, edge scalloped; circuli very fine, complete.

16109. Bolalo Bay, Malampaya Sound, Palawan. December 21, 1908. Length 197 mm.

7252, 7253. Busbus Point, Siasi Island. September 20, 1909. Length 125 to 139 mm.

7101, 22790, 22791. Busin Harbor, Burias Island. March 8, 1909. Length 127 to 140 mm.

11070, 14542, 17186, 18722. Butauanan Island, Luzon. June 13, 1909. Length 129 to 160 mm.

18997. Cagayan, Sulu. June 8, 1909. Length 178 mm.

14984 [1362]. Calangaman Island, between Leyte and Cebu. March 16, 1909. Length 182 mm.

D. I, 11 or I, 12, first branched ray 1 7/8 to 2 1/4 in total head length; A. I, 7 or I, 8, first branched ray 2 3/4 to 3; least depth of caudal peduncle 3 to 3 1/8; pectoral I, 14 or I, 15, reaches slightly beyond bases of last dorsal and anal rays; ventral length longer than head, reaches base of last anal ray; lower caudal lobe 3 1/8? to 3 3/5? in rest of body.

Back olive brown, sides below and under surfaces silvery white. Iris silvery white. Dorsal and caudal pale uniform brownish. Iris whitish. Pectoral brownish, membranes darker terminally, upper half of fin with scattered blackish spots or blotches mostly

8713, 11735. Cupulaan Bay, Paytlao, Cuyo Island, February 24, 1909. Length 108 to 150 mm.

14836, 14837. Casogoran, Malhow Island. July 27, 1909. Length 98 to 110 mm.

13019. Cataingan Bay. April 17, 1908. Length 179 mm.

16851. Cataingan Bay. April 18, 1908. Length 153 mm.

5619. Caxisigan Island, North Balabac Strait. January 2, 1909. Length 175 mm.

7575. Cebu market. April 6, 1908. Length 183 mm.

7826, 7827. Cebu market. April 7, 1908. Length 152 mm. 2 examples.

18277, 18278. Galera Bay. June 9, 1908. Length 134 to 150 mm.

terminally and sometimes much less numerous or absent toward fin base. Ventral largely whitish marginally, medially dull or pale brownish.

India, East Indies, Formosa, Japan, Melanesia, Polynesia, Hawaii. I have identified the Indo Pacific Exocoetus poecilopterus Valenciennes with the present species as I have found no constant characters to separate them by.

1 example. Grande Island Reef.
January 8, 1908. Length 68 mm.

14441. Gubat, Sorsogon, Luzon.
June 23, 1909. Length 123 mm.

10904 to 10907. Isabela, Basilan Island.
September 11, 1909. Length 120 to 147 mm.

16554, 16555, 16558, 16560, 18554, 22059.
Langao Point, Luzon. June 24, 1909. Length
78 to 142 mm.

17530. Lampinigan Island, south of
Zamboanga. September 11, 1909. Length
130 mm.

14838. Little Santa Cruz, Zamboanga.
May 26, 1908. Length 112 mm.

3142, 6661, 6662, 21041. Little Santa
Cruz. May 28, 1908. Length 106 to 130 mm.

16971, 16972 [1334], 14666. Lode Bay,
Mestacado Island. March 13, 1909.
Length 134 mm. 2 examples.

4768, 4777 to 4781. Nogas Point, Panay. February 4, 1908. Length 275 to 310 mm.

U.S.N.M., No. 52358. Samoa. Bureau of Fisheries (04720). Length 220? mm. As Cypsilurus poecilopterus.

U.S.N.M., No. 52796. Bureau of Fisheries (03569). Length 298? mm. D. I, 11; A. II, 7; P. I, 14, with round scattered black spots terminally.

U.S.N.M., No. 55472. Bureau of Fisheries (03542). Length 290? mm. D. I, 12; A. I, 7; P. I, 14, marked with many black spots.

U.S.N.M., No. 55514. Bureau of Fisheries (02658). Length 350 mm. D. I, 12; A. I, 8; P. I, 14.

U.S.N.M., No. 71360. Tokyo, Japan. Albatross Collection. Length 260 mm. D. I, 11; A. I, 7; P. I, 15. As Cypsilurus poecilopterus.

11237. Mactan Island, Cebu. March 25, 1909.

14570, 16712. Maculabo Island, Luzon. June 14, 1909. Length 154 to 159 mm.

12156 [939]. Malcochin Harbor, Linapacan Island. December 19, 1906. Length 205 mm.

ging in
appear; on anteric
ist ot; across cheek four or f
about three across preorbital; interspaces betwe
somewhat orange; dorsal body color; dashes of blac
showing small spots anteriorly, fusing into larger
oblique bars posteriorly; caudal black, with margin
yellowish, few black spots and dashes on fin may be
seen by transmitted light; anal black, showing crims
by transmitted light, margin narrowly blue; ventrals
ale, orange stripe thru each membrane; pectoral
ays dusky; membranes hyalin; iris reddish.

A. H. A. P., No. 28244. Honolulu.
Dr. J. L. Wood. 1898. Stanford
University.

. 7388. Port Caltom, Buanangan.
December 15, 1908. Length 210 mm.

A 533. Tambaun, Siguembal.
September 14, 1909. Length 290 mm.

S 7497 U.S.N.M. Japan. P. L. Jouy.
Length 156 to 180 mm. 2 examples.

Cypselurus spilopterus (Valenciennes)

Exocoetus spilopterus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 113, 1846 (type locality: Ovalau, Caroline Islands).

— Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 116, 1864 (Celebes); Atlas Ichth. Ind. Néerl., vol. 6, p. 74, pl. ( ) 250, fig. 2, 1866-72 (Celebes).—

Günther, Cat. Fishes Brit. Mus., vol. 6, p. 292, 1866 (copied); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 368, 1909 (Tahiti). — Weber, Siboga Exped., vol. 57, Fische, p. 126, 1913 (between Buru and Batjan).

Cypsiluru spilopterus Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 187, 1922 (Pulu Weh; Java Sea; Gorontalo, Celebes; between Butan and Buru).

Cypselurus spilopterus Fowler, Occas. Papers Bishop Mus., vol. 8, no. 7, p. 375, 1923 (Honolulu); Mem. Bishop Mus., vol. 10, p. 83, 1928 (Honolulu; Tahiti; Society Islands).

Exocoetus poecilopterus (not Valenciennes) Day, Fishes of India, pt. 3, p. 518, pl. 120, fig. 4, 1877 (part); Fauna British India, Fishes, vol. 1, p. 430, fig. 138 (copied), 1889.

Cypsilurus atrisignis Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 436, pl. 3, 1902 (1903) (type locality: Honolulu). — Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 136, pl. 25, 1903 (1905) (type). — Jordan and Seale, Bull. Bur. Fisher., vol. 25, p. 210, 1905 (1906) (Kusai or Strong Island, Carolines). — Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 187, 1922 (Malacca Straits).

Exocoetus atrisignis Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 368, 1909 (Hawaii; Ualan; Strong Island; Greenwich Island).

Cypselurus atrisignis Fowler, Mem. Bishop Mus., vol. 10, p. 83, 1928 (Ebon Island; type; Honolulu); Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (Tuamotus).

Depth 5 1/4 to 5 1/3; head 4 to 4 1/8 in width 1 3/5 to 1 4/5. Snout 3 3/4 to 4 in head from snout tip; eye 3 to 3 1/5, greatly exceeds snout, 1 4/5 to 1 1/2 in interorbital; maxillary reaches 3/5 to 4/5 to eye, length 4 1/3 to 4 2/3 in head from snout tip; teeth minute, simple, small, in narrow band in each jaw; interorbital 2 1/5 to 2 1/3, broad, slightly concave. Gill rakers 5 + 17, lanceolate, 1 2/5 in gill filaments, which 1 3/4 in eye.

Scales 50 to 55 in lateral or axial series to caudal base and 5 to 8 more on latter; 9 above, 3 below, 39 or 40 predorsal. Scales with 4 to 7 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 12 to I, 14, first branched ray 1 7/8 to 2 in total head length; A. II, 7 to II, 9, first branched ray 3 1/2? to 3 3/4; least depth of caudal peduncle 3 1/8 to 3 1/3; pectoral rays I, 12 to I, 15, fin extends little beyond bases of last dorsal and anal rays; ventrals reach penultimate anal ray base, greatly longer than head; lower caudal lobe 3 2/5? in rest of fish.

17, 17657, 18816. Pandanon Island. March 23, 1909. Length 114 to 162 mm.

21440. Panpan, Tara Island. September 20, 1909. Length 140 mm.

21556. Pilar Island. September 12, 1909. Length 135 mm.

9272, 10358. Port Dameko, Luzon. July 13, 1908. Length 132 to 155 mm.

20531. Port Galera. October 27, 1909. Length 142 mm.

19137. Port Langcan, Dumaran Island. April 7, 1909. Length 168 mm.

7800. Port San Pio Quinto, Camiguin Island. November 10, 1908. Length 130 mm.

13199. Quinalasag Island, Luzon. June 12, 1909. Length 150 mm.

13360. Tablayan. December 12, 1908. Length 128 mm.

18644, 18645. Tuboon Island, Ragay Gulf, Luzon. March 10, 1909. Length 121 to 130 mm.

Back olive brown, sides below and under surface silvery white. Iris silvery white. Dorsal and caudal dull brown. Pectoral dull dusky, rays paler; terminally on membranes of shorter or lower rays scattered small rounded blackish spots; lower fin edge whitish. Ventral brownish medially, broad border pale or whitish, in front and behind.

India, Malacca, East Indies, Micronesia, Polynesia, Hawaii. Although I have previously admitted Cypsilurus atrisignis Jenkins as a distinct species, the chief character for its distinction seems to rest on the presence of the black

18156. San Miguel Harbor, Marbate Island. April 21, 1908. Length 150 mm.

14015. Santo Domingo, Batan Island. November 7, 1908. Length 142 mm.

17973. Simaluc ~~Island~~, Sibi Sibi Island. September 23, 1909. Length 130 mm.

11328. San Roque, Leyte. July 29, 1909. Length 174 mm.

19544 to 19547, 21875, 21876. Singaan Island, between Jolo and Tawi Tawi. September 21, 1909. Length 100 to 138 mm.

22758. Sitanlai Reef. September 21, 1909. Length 113 mm.

17670, 17671. Sitanlai Reef. September 24, 1909. Length 120 to 128 mm.

20056, 20057. South Lagoon, Tumindao Reef, Tawi Tawi Group. February 26, 1908. Length 110 to 120 mm.

round spot near the middle of its dorsal fin. Weber and Beaufort mention it and say of it "which may be wanting." The presence of 56 to 62 scales and D. 13 to 15, compared with scales 50 to 55 and D. 12 or 13, are hardly conclusive characters for distinction. Also 40 predorsal scales for C. atrizonis and 30 for the present species are hardly of importance.

ventral 1½.

Body brown. Iris golden. Dorsal yellow, broadly blackish basal band. Ventral above slightly inclined blackish band from front short rays to mid edges of supero-median ones; similar one from lower front short rays to hind edges of infero-median ones. Fins otherwise golden. Length 44mm. (Bleeker.)

East Indies.

U. S. N. M., no. 50913. Dr. O. P. Jenkins. Bureau of Fisheries (197). Length 330? mm. Type of Cyprsilurus atrisignis. Lower gill rakers 17. Predorsal scales 41 forward to front of snout. D. II, 13; A. I, 9; P. I, 13.

U. S. N. M., no. 55171, two examples. Bureau of Fisheries (2518). Lat. 53°41'45" N., long. 167°27'20", Bering Sea. August 18, 1890. Length 330? mm.

Bureau of Fisheries (2667). Lat. 36° 48'16" N., long. 121°47'38" W., off Hawaii. October 11, 1891. Length 340? mm.

Two examples (with U. S. N. M., no. 55514). Bureau of Fisheries (2615). Length 310 mm. D. I, 11; A. I, 7; P. I, 14.

Bureau of Fisheries (2555). Length 348 mm. D. I, 14; A. I, 10; P. I, 13. Both at Cyprsilurus

Pseudochromis cyanotaenia Bleeker

Pseudochromis cyanotaenia Bleeker, Nat. Tijds. Ned. Indië, vol. 13, 1857, p. 72. Kajeli. — Weber, Siboga Exped., Fische, vol. 57 65, 1913, p. 263 (Valeyer, Tuir, Elat, High Key).

Pseudochromis (Leptochromis) cyanotaenia Bleeker, Verhand. Kon. Akad. Wet. Amsterdam, No. 5, vol. 15, 1875, p. 21, pl. 1, fig. 2 (Buru, Amboina, Ceram); Atlas Ichth. Ind. Néerl., vol. 9, 1876-77, pl. (1) 390, fig. 6.

Depth 3 1/2; head 3. Snout 4 in head from snout tip; eye 3, greater than snout, ~~subequal with interorbital~~; maxillary reaches 1/3 in eye, expansion 1/2 of eye, length 2 3/4 in head measured from snout tip; teeth in jaws in many rows, 3 canines above and 2 below anteriorly; narrow horse shoe like band of fine teeth on vomer and palatines;

Sinuk.

U. S. N. M., No. 65703. Lat. 23°23' N., long. 129°45' W. Albatross Collection (3165). January 12, 1892. Length 370? mm. D. I, 13; A. I, 9; P. I, 12. Lower hind pectoral edge with some scattered submarginal dark spots.

U. S. N. M., No. 89735. Near Tsuamoto Islands. Pinchot Expedition. Length 408? mm. Scales 50+5 in lateral series; 42? predorsal. D. I, 12; A. I, 9; P. I, 12. Large black blotch on dorsal.

Pseudochromis olivaceus Rüppell

Pseudochromis olivaceus Rüppell, Neue Wirbelth. Fische, 1835, p. 8, pl. 2, fig. 3. Red Sea. — Günther, Cat. Fishes Brit. Mus., vol. 2, 1860, p. 257 (copied). — Klunzinger, Verh. Zool. bot. Gesell. Wien, vol. 21, 1871, p. 517 (Red Sea). — Schmeltz, Cat. Mus. Godeffroy, No. 5, 1877, p. 13 (Red Sea). — Klunzinger, Fische Roth. Meer., 1884, p. 124. — Pellegrin, Bull. Mus. Hist. Nat. Paris, vol. 10, 1904, p. 544 (Djibouti, Red Sea).

Depth 3; head 3. Snout 3 2/3 in head from snout tip; eye 5, 1 1/4 in snout; maxillary reached opposite front eye edge, expansion 1/2 of eye, length 3 in head from snout tip; interorbital moderately high.

Scales 48 in median lateral series to caudal base and 7 more on latter; tubular scales 36 in upper section of lateral line,

Cypselurus bilobatus Weber and Beaufort

Cypsilurus bilobatus Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 185, 1922 (type locality: South coast of New Guinea).

Exocoetus furcatus (not Mitchill) Weber, Zool. Forsch. Austral. Semon, vol. 5, p. (114) 274, 1895 (above material).

Cypselurus furcatus Fowler, Proc. Acad. Nat. Sci. Philadelphia, vol. 77, p. 202, 1925 (Durban beach); Mem. Bishop Mus., vol. 10, p. 83, 1928 (copied; part).

Exocoetus bahiensis (not Rangani) Barnard, Ann. South African Mus., vol. 22, pt. 2, p. 1022, Oct. 1927 (Fowler's record).

depth 5 to 5 1/8; head 3 3/4 to 4 1/8, width 1 3/5 to 1 3/4. Snout 4 to 5 in head from snout tip; eye 2 7/8 to 3 1/4, greater than snout, 1 1/3 to 1 1/2 in interorbital; maxillary nearly or quite reaches opposite front eye edge, length 3 3/4 to 3 7/8 in head from snout tip; teeth hardly evident; each mandibular ramus with broad cutaneous flap laterally long as

-darker at base and near margin;
5 or 6 long waved slaty lines
longitudinally along upper half of
dorsal fin; traces of lines below,
especially anteriorly. Anal like dorsal
but much darker, bars present but
much obscured by general tone. Broad
whitish bar at caudal base and posterior
end of caudal peduncle, merging into
origin at fin edge; orange extends
posteriorly beyond whitish bar along
external rays of caudal and breaks
into round dots over outer half of lobes;
rest of caudal blackish. Pectoral brown,
membranes hyaline. Ventrals similar,
nearly black.

orbit; interorbital 2 1/3 to 2 1/2, broad, shallowly concave. Gill rakers 6 + 11, lanceolate, 1 2/5 in gill filaments, which 1 3/5 in iris.

Scales 42 or 43 in median lateral series to caudal base and 3 more on latter, mostly fallen and count according to pockets; 8 above, 30? predorsal. Scales with basal radiating striae, edge scalloped; 17 to 19 circuli, complete.

D. I, 12, I, first branched ray 1 1/10 to 1 1/4 in total head length; A. I, 8 to I, 10, first branched ray 2 to 2 2/5; least depth of caudal peduncle 3 1/8 to 3 1/5; P. I, 12 to I, 14, reaches far as middle of dorsal base or last dorsal ray base; ventral reaches far as middle of last depressed anal ray, or

Apharens furcatus (Lacépède)

Labrus furcatus Lacépède, Hist. Nat. Poiss., vol. 3, 1802, pp. 429, 447, pl. 21, fig. 1. The Great Ocean [Mauritius].

Apharens furcatus Günther, Cat. Fishes Brit. Mus., vol. 1, 1859, p. 386 (compiled); Journ. Mus. Godeffroy, vol. 1, pt. 1, 1873, p. 17 (Society Islands). — Bleeker, Atlas Ichth. Ind. Néerl., vol. 8, 1876-77, p. 80 (not pl. [21] 299, fig. 2) (Amboina). — Streets, Bull. U. S. Nat. Mus., No. 7, 1877, p. 90 (Fanning Islands). — Jordan and Starks, Proc. U. S. Nat. Mus., vol. 23, 1901, p. 719, pls. 28-29 (Odawara; skeleton). — Jenkins, Bull. U. S. Fish Comm., vol. 22, 1902 (1903), p. 451 (Honolulu). — Jordan and Thompson, Proc. U. S. Nat. Mus., vol. 39, 1911, p. 467, fig. 7 (Odawara). — Jordan and Starks, Annals Carnegie Mus., vol. 11, Nos. 3-4, 1917, p. 450 (Ceylon; Japan). — Fowler, Bull. Bishop

beyond tip of same though not quite to caudal base, fin 2 1/3 to 2 1/2 in entire length to caudal base; lower caudal lobe 3 1/5 to 3 3/5 in rest of body, upper lobe 1 2/5 to 1 3/5? in lower lobe.

Back brown, usually pale. Sides and lower surface silvery white, with 7 darker lateral blotches which extend across entire under surfaces; first from eye, second at pectoral base, third midway between pectoral and ventral, fourth at ventral base, fifth before dorsal, sixth above front part of anal and seventh on caudal peduncle. Barbels pale, edged blackish, also hind lobe black. Iris silvery white. Dorsal dusky to

striae; apical denticles 55 to 70, small points, with 7 or 8 transverse series of basal elements; circuli fine.

D. X, 14, I, second spine 1½ to 1 2/3 in total head length; A. III, 12, I, third spine 3 3/4 to 3 4/5, first ray 3 1/2 to 3 3/5; caudal 1 1/8 to 1 1/5, well forked; least depth of caudal peduncle 3 2/5 to 3 2/3; pectoral 1 1/8 to 1 1/5; ventral 1 2/3 to 1 4/5.

Brown generally, grayish above, below paler to whitish. Dorsals brownish. Caudal pale, end of each lobe black.

East Indies, Philippines, Japan, Micronesia. Known by its uniform coloration, the caudal alone contrasted with black tips.

blackish, with broad white band parallel and submarginal with upper fin edge. Anal white, with dusky blotch in front and hind upper edge blackish. Caudal white, lower lobe with subterminal dark brown blotch and smaller medially; fin base with dark transverse bar. Pectoral blackish, especially terminally, edges above and below whitish, also oblique white bar before middle or nearer base. Ventrall whitish, blackish over terminal 2/3 and basally dark brown blotch. Largest example shows pectoral little different or more whitish with dark basal transverse bar, another subbasal and parallel, along upper edge submarginal black

+ on preopercle flange. Scales with 8 to 10 short basal marginal striae; apical denticles 4 & to 6 5, small, with 3 or 4 transverse series of basal elements; circuli fine.

D. XI, 15, third dorsal spine 1 1/3 to 1 2/5 in head, third ray 1 1/5 to 1 2/5, A. III, 10, second spine 1 9/10 to 2 1/8, third ray 2 1/4 to 2 4/5; caudal 1 1/2, slightly obtuse, angled behind; least depth of caudal peduncle 3 1/8 to 3 1/5; pectoral 1 3/4 to 1 4/5; ventral 1 2/5 to 1 3/5.

Brown, below paler. Upper dorsal membranes and ventrals blackish terminally. Edges of soft dorsal and anal narrowly blackish.

China, Japan.

blotch, another subterminal and lower inner portion of fin largely blackish. Variation also seen in ventral fin where most of inner area of fin dark to dusky.

East Indies, Philippines.

Cypselurus bilobatus Weber and Beaufort

Cypselurus bilobatus Weber and Beaufort,
Fishes Indo Austral. Archip., vol. 4,
p. 185, 1922 (type locality: South coast
of New Guinea).

Exocetus furcatus (not Mitchill) Weber,
Zool. Forsch. Austral. Semon, vol. 5,
p. (114) 274, 1895 (coast of New Guinea).

Cypselurus furcatus Fowler, Mem. Bishop

One example. Lat. 25° 10' N., long. 166° 20' W. November 3, 1907. Length 23 mm. D. I, 11. A. I, 8. Each pectoral with 3 transverse black bands, ventral with 2. Mandibular barbel nearly long as head.

D. 5226. Corregidor Light, N. 10° E., 9.50 miles (Lat. 14° 12' 15" N., Long. 120° 32' 24" E.), China Sea. South of Corregidor. May 4, 1908. Length 70 mm.

1 example. Carimo Island near Dast. June 15, 1909. Length 19 mm.

1 1/2 in [illegible]
D. III, 9, I, second spine 1 4/5,
fourth ray 2; caudal 1 1/2,
convex behind; least depth of
caudal peduncle 2 4/5; pectoral
1 2/5; ventral 1 1/5.

Silvery gray, with 4 reddish
brown horizontal bands; first
along spinous dorsal base;
second from middle of predorsal
to middle of soft dorsal base;
third from eye to base of last
dorsal ray and front of caudal
peduncle; fourth from head to
ocellus, with dusky rim, at upper angle
of opercle, slightly smaller than eye.
Lips dusky over brown. Iris like body.
Cheeks mottled with spots and lines of
light brown. Dorsal with deep blue

Three examples. Jolo. Electric light. February 8, 1908. Length 16 to 31 mm. D. I, 13. A. I, 9. Pectoral brownish, blackish subterminally, not banded.

1 example. Jolo anchorage, Jolo. Electric light. March 5, 1908. Length 36 mm. 20 barbels.

and Luzon. April 24, 1908. Length 32 mm.

One example. D. 5128. Rogas Island (W.), N. 6° E., 32.50 miles (lat. 9° 52'

4 examples. San Miguel Bay, west side. June 14, 1909. Length 21 to 23 mm. A. I, 7. 20 barbels.

Ten examples. D. 5361. Seomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5° 50' 45" N., long. 121° 1' 15" E.), Jolo Island and vicinity. September 19, 1909. Length 36 to 84 mm.

Three examples. Jolo. Electric light. February 8, 1908. Length 16 to 31 mm. D. I, 13. A. I, 9. Pectoral brownish, blackish subterminally, not banded.

One example. D. 5223. Malabrigo Light, W., 9.80 miles (lat. 13°36' N., long. 121°25'30" E.), between Marinduque and Luzon. April 24, 1908. Length 32 mm.

One example. D. 5128. Rogas Island (W.), N. 6° E., 32.50 miles (lat. 9°52'10" N., long. 121°49'35" E.), Sulu Sea, vicinity southern Panay. February 4, 1908. Length 30? mm.

Six examples. D. 5561. Teomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5°50'45" N., long. 121°1'15" E.), Jolo Island and vicinity. September 19, 1909. Length 36 to 84 mm.

Inst., no. 22, 1925, p. 26 (Honolulu). — Jordan, Evermann, Tanaka, Proc. Cal. Acad. Sci., series 4, vol. 16, no. 20, November 14, 1927, p. 672 (Honolulu). — Fowler, Mem. Bishop Mus., vol. 10, 1928, p. 194 (Honolulu, Fanning Islands, type of Upharens flavivultus, Society Islands).

Caranxomorus sacrestinus Lacépède, Hist. Nat. Poiss., vol. 5, 1803, pp. 681, 682. No locality (on Commerson).

Upharens caeruleoscens Cuvier, Hist. Nat. Poiss., vol. 6, 1830, p. 487, pl. 167 b. Port Louis, Mauritius. — Guichenot, Notes Ile Réunion, vol. 2, 1862, p. 25.

Upharens flavivultus Jenkins, Bull. U. S. Fish Comm., vol. 19, 1899 (1901), p. 390, fig. 1. Honolulu; vol. 22, 1902 (1903), p. 451 (Kona, Hawaii). — Snyder, Bull. U. S. Fish Comm., vol. 22, 1902 (1904), p. 522 (Honolulu). — Jordan and Evermann, Bull. U. S. Fish Comm.,

One example. D. 5601. Limbe Island (N.E.), N., 20.7 miles (lat. 1° 13'10" N., long. 125°17'5" E.), Gulf of Tomini, Celebes. November 7, 1909. Length 24 mm. Mandibular barbel nearly 7/8 of head.

vol. 23, pt. 1, 1903 (1905), p. 235 (Honolulu, Kailua, Hilo). — Jordan and Richardson, Proc. U. S. Nat. Mus., vol. 34, 1908, p. 611. (Honolulu).

Asphareus (Asterestinus) flavovultus Jordan, Evermann, Tanaka, Proc. Cal. Acad. Sci., series 4, vol. 16, no. 20, November 14, 1927, p. 671 (Honolulu).

Depth 3 to 3 1/5, head 3 to 3 1/5, width 2 1/8 to 2 1/5. Snout 3 to 3 1/8 in head from snout tip; eye 4 to 4 3/5, 1 1/3 to 1 2/5 in snout, 1 1/3 to 1 1/2 in interorbital; maxillary reaches 2/3 to 3/4 in eye, expansion 1 4/5 to 2 in eye, length 1 4/5 to 2 in head from snout tip; teeth in villiform bands in jaws of about 4 or 5 irregular rows and an outer slightly enlarged row; no teeth on palate or tongue; interorbital 2 7/8 to 3, broadly convex; preopercle entire, flange with

Cypselurus unicolor (Valenciennes)

Exocoetus unicolor Valenciennes, Hist.

Nat. Poiss., vol. 19, p. 97, 1846 (type locality: Vanicolo). — Bleeker, Verhand. Batavia. Genoot. (Knock.), vol. 24, p. 21, 1852 (Batavia); Nat. Tijds. Nederl. Indië, vol. 2, 1856, p. 95 (Banda); Act. Soc. Sci. Ind. Néerl., vol. 1, No. 5, p. 7, 1856 (Amboina); vol. 2, No. 7, p. 8, 1857 (Amboina); vol. 3, No. 2, p. 22, 1857-58 (Japan); vol. 3, No. 4, p. 4, 1857-58 (Macassar); Nat. Tijds. Nederl. Indië, vol. 13, p. 385 (Batjan); vol. 15, p. 243, 1858 (Singapore); vol. 16, p. 408, 1858 (Japara, Java); vol. 17, p. 143, 1858-59 (Boleling, Bali); Act. Soc. Sci. Ind. Néerl., (Sumatra), vol. 8, p. 11, 1859 (Padang; Priaman); Nat. Tijds. Nederl. Indië, vol. 21, p. 331, 1860 (Cochin China).

Cypsilurus unicolor Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 189, 1922 (Java Sea, Flores, Obi). — Whitley, Journ. Pan Pacific Inst., vol. 3, no. 1, Jan.-Mar. 1928, p. 11 (Santa Cruz Islands).

? Exocaetus commersonnii Lacépède, Hist. Nat. Poiss., vol. 5, pp. 401, 403, 1803 (no locality: on Commerson).

Exocoetus commersonii Valenciennes, Hist. Nat. Poiss., vol. 19, p. 102, 1846 (Mauritius; lat. 34° S. at 40 leagues off Brazil). — Guichenot, Notes Ile Réunion, vol. 2, p. 29, 1862. — Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 75, 1866-72 (Banda). — Sauvage, Hist. Nat. Madagascar, Poiss., pp. 526, 1891 (reference).

Cypselurus unicolor (Valenciennes)

Exocoetus unicolor Valenciennes, Hist. Nat.

Poiss., vol. 19, p. 97, 1846 (type locality: Vanicolo); Act. Nov. Sci. Ind. Néerl., (Acht. Sumat.), vol. 8, p. 11, 1859 (Padang; Priaman).

Exocaetus exiliens (not Müller) Lacépède, Hist. Nat. Poiss., vol. 5, pp. 401, 403, pl. 12, fig. 3, 1803 (off Brazil).

Exocoetus oligolepis Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 109, 1866 (type locality: Batavia; Bali; Sumatra; Singapore; Makassar; Batjan; Amboina; Banda); Atlas Ichth. Ond. Néerl., vol. 6, p. 69, pl. ( )248, fig. 3, 1866-72 (Java; Bali; Sumatra; Singapore; Celebes; Batjan; Amboina; Banda). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 296, 1866 (type). — Volz, Nat. Tijds. Nederl. Indië, vol. 66, p. 181, 1907 (Sumatra). — Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 370, 1909 (Tahiti).

Exocaetus oligolepis Elera, Cat. Fauna Filipinas, vol. 1, p. 577, 1895 (Luzon; Manila).

Cypsilurus oligolepis Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 189, 1922 (Java Sea; Batavia; Flores; Obi). — Duncker and Mohr, Mitteil. Zool. Mus. Hamburg, vol. 42, p. 129, 1926 (near New Guinea east of Long Island).

Cypselurus oligolepis Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1927, p. 263 (Dumi and Drian, Philippines); Mem. Bishop Mus., vol. 10, p. 84, 1928 (compiled).

Exocoetus brachysoma Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 111, 1866 (type locality: Java; Makassar, Celebes; Labukka, Batjan; Amboina). —

Günther, Cat. Fish. Brit. Mus., vol. 6, p. 295, 1866 (type; Zanzibar). — Bleeker, Atlas Ichth. Ind. Neerl., vol. 6, p. 70, pl.

(·) 247, fig. 1, 1866-72 (Java; Celebes; Batjan; Amboina); Rech. Faune Madagas. Pollen et Van Dam, pt. 4, p. 101, 1874 (Bourbon). — Martens, Preuss. Exped. Ost. Asien, vol. 1, pp. 325, 401, 1876 (between Macassar and Surabaya).

— Boulenger, Proc. Zool. Soc. London, 1887, p. 666 (Muscat). — Savage, Hist. Nat. Madagascar, Poiss., p. 526, 1891 (reference). — Vols, Nat. Tijds. Ned. Indië, vol. 66, p. 181, 1907 (Priaman). — Weber, Siboga Exped, vol. 57, Fische, p. 125, 1913 (Taiwan, Obi Major). — Lampe, Deutsch. Südpolar Exped., vol. 15, p. 225, 1914 (between Cape of Good Hope and Kerguelen).

Cypsilurus brachysomus Jordan and Veale, Bull. Bur. Fisher., vol. 26, p. 9, 1906 (1907) (Cavite).

Cypselurus brachysoma Fowler and Bean, Proc. U. S. Nat. Mus., vol. 62, p. 13, 1922 (Cebu).

Exocoetus neglectus Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 112, 1866 (type locality: Sumatra;). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 296, 1866 (type). — Bleeker, Atlas Ichth. Ind. Neerl., vol. 6, p. 71, pl. ( ) 247, fig. 2, 1866-72 (Sumatra; Singapore; Batjan).

Exocoetus socotranus Steindachner,

~~Zool.~~ Anzeiger Akad. Wiss. Wien, vol. 39, Nr. 24, p. 318, Nov. 20, 1902 (type locality: between Abdal Kuri and Socotra); denkw. Akad. Wiss. Wien, math.-nat. Kl., vol. 71, pt. 1, p. 155, 1907 (high sea between Abd-el-Kûri and Socotra).

Cypsilurus quindecimradiatus (not Fowler) Jordan and Veale, Bull. Bur. Fisher., vol. 25, p. 210, fig. 15, 1905 (1906) (southward of Samoa).

Cypselurus ogilbyi (Jordan and Snyder) Jordan and Dickerson, Proc. U. S. Nat. Mus., vol. 34, p. 604, fig. 1, 1909 (type locality: west of Walpole Island, nearest land the New Hebrides). — Whitley, Journ. Roy. Pacific Res. Inst.,

vol. 2, no. 1, p. 4, Jan.-Mar. 1927 (Fiji).

Exocoetus ogilbyi Günther, Journ. Mus. Godeffroy, Fool. 8, pt. , p. 3 71, 1909 (copilda).

Cypsiluru bahiensis (not Ranzani) Kendall and Goldsborough, Mem. Mus. Comp. Zool., vol. 26, p. 253, 1911 (Arno, Marshalls).

Cypselurus bahiensis Fowler, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Arno specimen).

Cypsiluru opisthopus (not Bleeker) Bean and Weed, Proc. U. S. Nat. Mus., vol. 42, p. 595, 1912 (Java).

Depth 5 to 5 2/3; head 3 4/5 to 4 1/8, width 1 4/5 to 1 9/10. Snout 3 3/4 to 4 in head from snout tip; eye 3 to 3 1/8, greater than snout, 1 1/4 to 1 1/3 in interorbital; maxillary reaches 3/5 to 7/8 to eye, length 4 to 4 3/5 in head from snout tip; teeth small, simple, conic, in narrow band in each jaw; interorbital 2 1/4 to 2 1/2, broad, shallowly depressed. Gill rakers 3 or 4 + 13 to 16, lanceolate, rather short or 1/2 gill filaments, which 1 3/4 to 2 in eye.

Scales 40 to 46 in lateral axial series to caudal base and 4 to 6 more on latter; 7 or 8 above, 2 or 3 below, 32 to 38 predorsal. Scales with 4 to 6 basal radiating striae, edge scalloped; circuli very fine, complete.

D. $\underline{I}$, 10 to $\underline{I}$, 12, first branched ray 2 1/8 to 2 2/3 in total head length;

Pseudochromis flavivertex Rüppell

Pseudochromis flavivertex Rüppell, Neue Wirbelth. Fische., 1835, p. 9, pl. 2, fig. 2, Massaua, Red Sea. — Günther, Cat. Fishes Brit. Mus., vol. 2, 1860, p. 258 (Red Sea). — Klunzinger, Verh. zool. bot. Gesell. Wien, vol. 21, 1871, p. 518 (name only); Fische Roth. Meer., 1884, p. 124.

depth 3 3/5; head 3 3/5. Snout 3 in head from snout tip; eye 3 4/5, 1 1/8 in snout; maxillary reaches opposite front of eye, expansion 2 in eye, length 3 in head from snout tip; interorbital low. Scales 48 in median lateral series to caudal base and 3 more on latter; upper section of lateral line with 43 tubular scales, lower section with 11 to caudal base and 3 more on latter; 2 scales above lateral line, 10 below, 22 predorsal extending forward opposite front pupil

A. I, 8 or I, 9, first branched ray
3 1/10 to 3 3/4; least depth of caudal
peduncle 3 1/5 to 3 1/2; P. I, 14,
reaches opposite base of sixth
branched anal ray or base of
penultimate dorsal ray; ventral
little shorter to
longer than head, reaches opposite
fourth anal ray base or nearly
far back nearly far as pectoral
tip; lower caudal lobe 3 2/5 to 3 7/8
in rest of fish, upper lobe 1 1/4 to 1 1/3
in head.

Back olive brown, sides and
lower surfaces silvery white. Iris
silvery white. Dorsal and caudal
pale brownish. Anal whitish.
Pectoral dusky, paler subbasally
and darker terminally. Ventral
brownish medially, edges broadly
paler or whitish, especially inner

Pseudochromis nigrovittatus Boulenger

Pseudochromis nigrovittatus Boulenger, Ann. Mag. Nat. Hist. London, series 6, vol. 20, 1897, p. 421. Mekran Coast, Persia. — Regan, Journ. Bombay Nat. Hist. Soc., vol. 16, pt. 2, 1905, p. 330 (Persian Gulf).

Depth 5 in total; head 4. Snout equals eye, which 4 in head and slightly exceeds interorbital; maxillary reaches opposite first third in eye. Scales 53, 2 above, 13 below; tubes in lateral line 33 to 35, 10. Cheeks with 6 rows of scales. Large scales on opercle. D. II, 28, soft rays 2/3 of head; A. II, 15; caudal bifurcate, outer lobes longest; caudal peduncle long as deep; pectoral 2/3 of head, long as ventral. Olive brown above, yellowish white beneath. Black stripe each side of tail from snout tip through eye to middle caudal rays. Fins yellowish. Length 80 mm. (Boulenger.)

margins.

Arabia, Zanzibar, Mauritius, Reunion, Bourbon, Malaya, East Indies, Philippines, Cochin China, Japan, Melanesia, Micronesia and Polynesia. Also in the Atlantic.

I have admitted the present species with the description by Valenciennes chiefly, as it is described with "D. 13; A. 11", moreover it is described with "les pectorales, d'un gris violacé, n'ont ni la tache blanche ni la bordure de la précédente" [Exocoetus speculiger]. While all my specimens of the present species show a more or less pale area on the pectoral subbasally below it is sometimes quite inconspicuous or little evident.

Diagnosis. Known by the dark brown or blackish transverse band extending down from each side of the occiput through the eye and across cheek behind maxillary.

Type. — Cat. No. 89991, U.S.N.M. [2/04.] Dowarra Island, Dutch East Indies. December 2, 1909. Length 97 mm.

There is little doubt that
Exocoetus oxotramus Steindachner,
determined alternately as well
as doubtfully E. brachysoma
Bleeker, is this species. It is
described with D. 10, A. 8, scales
50, based on an example 210 mm.

Chaetodon larvatus (Ehrenberg) Cuvier, Hist. Nat. Poiss., vol. 7, 1831, p. 55. Red Sea. — Günther, Cat. Fish. Brit. Mus., vol. 2, 1860, p. 31 (copied). — Playfair, Fishes of Zanzibar, 1866, p. 36 (Aden). — Klunzinger, Verh. zool. bot. Ges. Wien, band 20, 1870, p. 108 (Red Sea). — Kaufmann and Kauber, — Lehl, Arch. Naturges., band 89, abth. A, heft 5, 1923, p. 177 (Massaua).

Chaetodon (Amirochaetodon) larvatus Klunzinger, Fische Roth. Meer., 1884, p. 57.

Chaetodon larvatus Cuvier, l.c. Massaua.

Chaetodon (Amirochaetodon) triangulum var. larvatus Klunzinger, l.c.

Chaetodon larvatus var. larvatus Lehl, l.c. (Massaua).

9090 to 9097. Catbalogan Anchorage, Samar. April 15, 1908. Length 158 to 178 mm. 8 examples.

7776 to 7779. Catbalogan Anchorage. April 17, 1908. Length 157 to 168 mm.

15488 [1485]. Cebu market. March 26, 1909. Length 200 mm.

13969 to 13971. Nato, Luzon. June 19, 1909. Length 167 to 185 mm.

4642. Port Binanga, Subig Bay. January 8, 1908. Length 177 mm.

11554 to 11560. San Miguel Bay. June 15, 1909. Length 152 to 170 mm.

4555, 4556. Subig Bay, Subig. January 6, 1907. Length 150 to 180 mm.

One example. Lingayan Bay. December 27, 1908. Length 203 mm.

about a dozen longitudinal whitish bands. Iris neutral slate. Deep brown band forward from each side of occiput to eye, little narrower than eye - and then down behind maxillary across cheeks, arching on subopercle. Dorsals and canals, former with slightly lighter margin above and with very numerous, oblique, narrow, whitish waved lines, mostly broken as short white bars or spots and inclined so as to form parallel and posteriorly. Caudal light yellowish, small brown medial basal spot. Pectoral pale brownish. Ventral blackish medially, broadly whitish on outer border, more narrow on inner.

U. S. N. M. No. 52348. Apia, Samoa. Bureau of Fisheries. Length 392 mm. D. I, 12; A. I, 9; P. I, 13. As Cypsilurus unicolor.

U. S. N. M., No. 52669. Bureau of Fisheries (03539). Length 248 mm. D. II, 11; A. II, 6; P. I, 14.

U. S. N. M. No. 55171. East of Hawaii. Bureau of Fisheries (2644). lat. 48°28'5" N., long. 124°36'55" W. August 28, 1891. Length 280 mm.
Bureau of Fisheries (2647). lat. 48°25'30" N., long. 124°42'15" W. September 1, 1891. Length 275 mm.
Bureau of Fisheries (2645). lat. 48°24'25" N., long. 124°37'45" W. August 29, 1891. Length 263 mm.
Bureau of Fisheries (2646). lat. 48°27'10" N., long. 124°39'50" W. August 29, 1891. Length 275 mm.

U. S. N. M. (two examples with No. 55514).
Bureau of Fisheries (2642).

5-2348

Length 275 mm.

Bureau of Fisheries (2643). Lat. 25°25' N., long. 79°55'15" W., West Indies. In 211 fathoms. April 9, 1885.

Length 260 mm.

Lat. 36°48' N., long. 121°53'50" W., off central U.S.N.M., No. 56116. California. In 138 fathoms. Bureau of Fisheries (3203). April 11, 1890.

Length 235 mm. D. I, 11; A. I, 8; P. I, 12; scales 48+6; 38 predorsal. As Cypselurus simus.

U.S.N.M., No. 65809. Arhno, Marshalls. Albatross Collection (A184). Length 310 mm. D. I, 11; A. I, 8; P. I, 14; gill rakers 4+18. As Cypselurus bahiensis.

U.S.N.M., No. 72565. Batavia, Java. O. Bryant and W. Palmer. April 2, 1909. Length 195 mm. As Cypselurus opisthopus.

U.S.N.M., No. 84191. Philippines. Dr. Fred Baker. Length 143 mm. As Cypselurus brachysoma.

A. M. S. P., No. ———. Honolulu. Dr. J. D. Wood. 1898. Stanford University. Length 330 mm.

A. M. S. P., No. 51338. Madras. 1922. Department of Fisheries of Bengal.

Pseudochromis rex Veale

Pseudochromis rex Veale, Philippine Journ. Sci., vol. 4, no. 6, 1909, p. 529. Sitankai Island, Jolo Archipelago.

Depth 2 7/8; head 3 1/3, width 2. Snout 4 2/5 in head from snout tip; eye 4, little greater than snout or interorbital; maxillary reaches 1/8 in eye, nearly vertical; expansion 2 in eye, length 2 2/5 in head from snout tip; teeth uniserial, small, conic in jaws, pair of wide set canines in front of each; small band of fine teeth on each palatine and across vomer, tongue smooth; interorbital 4 2/3, convex. Gill rakers 4+13, lanceolate, 4/5 gill filaments, which 1 3/4 in eye.

Scales 34 in median lateral series to caudal base and 10 more on latter; tubular scales 23 (25 on right side of

Cypselurus bahiensis (Ranzani)

Exocoetus bahiensis Ranzani, Nov. Comm. Acad. Sci. Inst. Bonon., vol. 5, p. 362, pl. 38, 1842 (type locality: Brazil). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 293, 1866 (Sumatra; Atlantic). — Bleeker, Atlas Ichth. Ind. Neerl., vol. 6, p. 71, 1866-72 (Sumatra). —

Klunzinger, Verh. zool. bot. Ges. Wien, vol. , p. 585, 1871 (Red Sea). — Lütken, Videnska. Medd. Natur. Foren. Kjöbenhavn, p. 402 (108), 1876 (Indian Ocean). — Day, Fishes of India, pt. 3, p. 519, pl. 121, fig. 10, 1877. — Bleeker, ~~hand.~~ Verslag. ~~Akad.~~ Akad. Wet. Amsterdam, vol. 18, p. 3, 1879 (Shanghai). — Jordan and Meek, Proc. U. S. Nat. Mus., vol. , p. 64, 1885 (copied). — Day, Fauna British India, Fishes, vol. 1, p. 431, 1889. — Steindachner, Denkschr. Akad. Wiss. Wien, math.-nat. Kl., vol. 70, pt. 1, p. 512, 1900

(Honolulu). — Vogt, Naturk. Tijds. Nederl. Indië, vol. 66, p. 180, 1907 (Padang). — Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 369, 1909 (Hawaii; Sumatra; Misol). — Gilchrist and Thompson, Ann. South African Mus., vol. 6, pt. 3, p. 266, 1909 (Natal). — Weber, Siboga Exped., vol. 57, Fische, p. 125, 1913 (lat. 4° N., long. 126° E.). —

Gilchrist and Thompson, Ann. Durban Mus., vol. 1, pt. 4, p. 311, 1917 (compiled). — Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 269, June 1925 (Natal).

Cypsilurus bahiensis Jenkins, Bull. U. S. Fish Comm., vol. 22, p. 432, 1902 (Honolulu). — Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 136, 1903 (1905) (Hilo; Honolulu). — Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 190, 1922 (Pulu Weh, Molucca Straits). — Chu, Biol. Bull. St. John's Univ., no. 1, p. 88, Jan. 1931 (reference).

Cypselurus bahiensis Fowler and Ball, Bull. Bishop Mus., vol. 26, p. 8, 1925 (Liscianshy). — Fowler, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Honolulu; Liscianshy; Hawaiian Islands; types of Cypselurus tahitensis and Cypsilurus quindecemradiatus; not. Arhno specimen; vol. 11, no. 5, p. 319, 1931 (compiled); Proc. U. S. Nat. Mus., vol. 80, art. 6, p. 6, 1932 (Cocos Island); Hong Kong Nat., vol. 3, nos. 3-4, p. 277, ~~fig~~ fig. 20, dec. 1932 (Micronesia, Polynesia, Hawaii, Atlantic).

5611. Calamgan Bay, Masbate Island.
March 14, 1909. Length 110 mm.

5523. Catbalogan, Samar. April 15, 1908.
Length 298 mm. Side of body pale dusky
cadmium, becoming grayish above and
below posteriorly, more dusky anteriorly.
Side crossed by 6 dusky bars, ground
color nearly sepia; on yellow ground
centers of scales with dark cobalt blue,
nearly slaty on dark bars. Front of head
black. Opercle black, edges of scales
dark green and black flap with scale

Exocoetus cyanopterus Valenciennes, Hist. Nat. Poiss., vol. 19, p. 97, 1846 (type locality: Bahia; Rio Janeiro). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 294, 1866 (copied). — Barnard, Ann. South African Mus., vol. 21, pt. 1, p. 270, June 1925 (Agulhas Bank).

— Jordan, Proc. U. S. Nat. Mus., 1886, p. 528 (type).

Exocoetus ~~Soy~~ vermiculatus Poey, Memor. Cuba, vol. 2, p. 300, 1861 (type locality: Cuba).

Exocoetus albidactylus Gill, Proc. Acad. Nat. Sci. Philadelphia, 1863, p. 167 (type locality: Caribbean Sea [Panama erroneous]).

Exocoetus spilonotopterus Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 113, 1863 (type locality: Padang, Sumatra); Atlas Ichth. Ind. Neerl., vol. 6, pl. (3) 249, fig. 2, 1866-72.

Cypsilurus spilonotopterus Jordan and Dickerson, Proc. U. S. Nat. Mus., vol. 34, p. 606, fig. 2, 1903 (type locality: Hawaiian Islands). — Jordan and Richardson, Mem. Carnegie Mus., vol. 4, p. 176, 1909 (copied).

Cypselurus spilonopterus Jordan and Richardson, Bull. Bur. Fisher., vol. 27, p. 243, 1907 (1908) (negros). — Whitley, Journ. Pan Pac. Inst., vol. 2, p. 4, Jan.- Mar., 1927 (Fiji); vol. 3, no. 1, p. 11, Jan.- Mar. 1928 (Santa Cruz Islands).

Exocoetus parrae Poey, Synop. Pisc. Cub., p. 385, 1868.

Cypsilurus quindecimradiatus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1899, p. 482, pl. 17 (type locality: Thornton Island [wrongly Caroline Islands]).

Cypselurus quindecimradiatus Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 15 (type).

Exocoetus quindecimradiatus Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 370, 1909 (copied).

Cypselurus tahitensis Seale, Occas. Pap. Bishop Mus., vol. 4, no. 1, p. 13, fig. 3, 1906 (type locality: Tahiti).

Exocoetus tahitensis Günther, Journ. Mus. Godeffroy, vol. 8, pt. 14, p. 371, 1909 (copied).

Depth 5 to 5 3/4; head 4 1/8 to 4 1/2, width 1 4/5 to 1 7/8. Snout 3 1/5 to 3 1/4 in head from snout tip; eye 3 3/5 to 4, slightly greater than snout to 1 1/8 in snout with age, 1 1/5 to 1 3/4 in interorbital; maxillary reaches 3/4 to 2/3 to eye, length 4 to 4 1/8 in head from snout tip; teeth very small, simple, conic, in bands in jaws, of 4 or 5 rows transversely in front, narrowing to 1 or 2 rows at sides of jaws; interorbital 2 1/2 to 2 2/3, broad, slightly or shallowly

concave. Gill rakers 5+17, lanceolate, 1½ in gill filaments, which 1⅔ in eye.

Scales 46 to 50 in median lateral series to caudal base and 4 to 6 more on latter; 8 above, 3 below, 40 or 41 predorsal. Scales with 6 or 7 basal radiating striae, edge scalloped; circuli very fine complete.

D. I, 13, first branched ray 1 3/5 to 2 in total head length; A. II, 8 to I, 10, first branched ray 2 4/5; least depth of caudal peduncle 3 to 3⅕; P. I, 14 or I, 13, reaches nearly or quite to caudal base; ventral reaches middle or slightly beyond middle of anal base; lower caudal lobe 3⅚ in rest of body.

Back brown, sides below and under surfaces silvery white. Iris silvery white. Dorsal and caudal brown, former with large black spot, well

contrasted, anteromedially on fin. Pectoral with membrane deep to dusky brownish, blackish terminally.

Red Sea, Natal, India, East Indies, Philippines, China, Polynesia, Hawaii. The largest species in our collection. It always shows a uniform pectoral in combination with the black spot on the dorsal. In this way it may be easily distinguished from Cypselurus spilopterus.

I am unable to find any characters -on which to separate Exocoetus cyanopterus Valenciennes. The distinctions given by Barnard as A. 9 or 10 for C. babiensis and A. 11 or 12 for C. cyanopterus are overreached by materials I have studied.

963 and 14011. West coast of Palui Island. November 18, 1908. Length 83 to 105 mm.

21551. Tidore Island, south of Ternate. November 25, 1907. Length 55 mm.

30650 U.S.N.M. New Guinea. Australian Museum. Length 55 to 85 mm. 2 examples.

32750 U.S.N.M. Indian Archipelago. Leiden Museum. Length 115 mm.

4773, 4775, 4782. Nogas Point, Panay.
February 4, 1908. Length 300 to 357 mm.

U.S.N.M., No. 52660.
Bureau of Fisheries (03567). Length 458 mm.

U.S.N.M., No. 89732. Cocos Island.
Pinchot Expedition. Length 413 mm.

A.N.S.P., No. 53192. Chatham Bay,
Cocos Island. 1929. Dr. W. A. Gilsby.
Pinchot Expedition.

Holacanthus loriculus Günther.

Holacanthus loriculus Günther, Journ. Mus. Godeffroy, band 2 - 3 heft 5-6, 1874, p. 53, plate 40, fig. C. Society Islands. — Fowler and Ball, Bishop Mus. Bull., no. 26, 1925 (1926), p. 18 (Johnston Island).

Yellow, with 5 vertical blackish bands, first twice width of others. Small scattered blackish spots on back above [illegible] Soft dorsal and anal with

Cypselurus hallbergi Fowler

Cypselurus hallbergi Fowler, Journ. Bombay Nat. Hist. Soc., vol. 32, no. 4, p. 705, pl. 1, 1928 (type locality: Ceylon).

Depth 5 1/4; head 4 1/2, width 1 3/5. Snout 3 1/2 in head from snout tip; eye 3 1/2, greater than snout, 1 1/5 in interorbital; maxillary reaches 4/5 to eye, length 3 1/2 in head from snout tip; interorbital 2 1/3, very slightly concave. Gill rakers 7 + 21, lanceolate, equal gill filaments or 1 7/8 in eye.

Scales 47 in axial lateral series to caudal base and 3 more on latter; 8 above, 3 below, 30 predorsal, extend forward little before nostril. Scales with 5 or 6 basal radiating striae, edge lobate; circuli fine.

D. I, 11, I, first ray 2 1/4 in total head; A. I, 9, I, first branched ray 3 1/8, origin opposite base of

second branched dorsal ray; least depth of caudal peduncle 3; upper caudal lobe 1 1/3 in lower, which 3 1/4 in rest of ~~fish~~; pectoral 1 1/2, not quite reaching caudal base, rays IV, 13; ventral I, 5, length 2 4/5, origin midway between hind eye edge and caudal base.

Back deep brown, lower sides and under surfaces whitish. Iris slate. Lower jaw pale. Dorsal and caudal pale brown. Anal whitish. Pectoral neutral brown medially, terminally dusky, pale basally and lower basal margin whitish. Ventral neutral brown medially and terminally, with broad inner whitish border, base and spine also pale.

Ceylon. Duly known from the type, unique in the presence of 4 simple pectoral rays.

A. N. S. P. ~~Example~~ No. 5-13723, type. Ceylon. 1922. Dr. F. Hallberg. Length 1 7/5 damaged (207 total) mm.

Cypselurus opisthopus (Bleeker)

Exocoetus opisthopus Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 121, 1866 (type locality: Celebes). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 297, 1866 (type; Amboyna). — Bleeker, Atlas Ichth. Ind. Néerl., vol. 6, p. 76, pl. ( ) 248, fig. 2, 1866-72 (Celebes; Amboina). — Weber, Siboga Exped., vol. 57, Fische, p. 125, 1913 (Valeyer; Banda).

Cypsilurus opisthopus Weber and Beaufort, Fishes Indo Austral. Arch., vol. 4, p. 191, 1922 (Flores; Ambon; Banda).

Cypselurus opisthopus Fowler, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Shortland Island).

Cypselurus oligolepis (not Bleeker) Veale, Occas. Pap. Bishop Mus., vol. 4, no. 1, p. 15, 1906 (Shortland Island).

Depth 4 4/5 to 5; head 4 to 4 1/4, width 1 3/5 to 1 2/3. Snout 3 3/5 to 3 7/8 in head from snout tip; eye 3 1/10 to 3 1/4, much greater than snout, 1 1/5 to 1 1/3 in interorbital; maxillary reaches 3/4 to 4/5 to eye, length 3 4/5 to 4 2/3 in head from snout tip; teeth very small, pointed, form narrow bands in jaws; interorbital 2 3/4 to 2 7/8, broad, nearly level or only very slightly depressed. Gill rakers 4+16, lanceolate, 1/2 of gill filaments, which 1 7/8 in eye.

Scales 45 or 46 in lateral or axial series to caudal base and 3 or 4 more on latter; 8 above, 2 below, 31 to 37 predorsal. Scales with 3 or 4 basal radiating

lateral line. Opercles scaly. Dorsal and anal bases scaly. Dorsal with 2 spines and 24 to 26 rays. Anal about half long as dorsal, spines 3 and rays 14 or 15. Caudal obtuse. Pectoral obtusely rounded. Ventral with spine and 5 rays, third ray longest.

Species of the Indo-Pacific, the largest and most handsome of the family.

Analysis of the species.

a.' Dampieria. Caudal rounded, moderately long, 1/5 to 1/3 in rest of body; 60 to 80 scales in oblique lateral series.

b.' Body without blackish longitudinal lines.

c.' Soft dorsal without black basal blotch.

d.' Soft dorsal uniform posteriorly. cyclophthalma

d.² Soft dorsal with longitudinal blue lines and bars posteriorly. spiloptera

c.' Soft dorsal with black basal blotch anteriorly.

striae, edge scalloped; circuli very fine, complete.

D. I, 10 or I, 11, first branched ray 2 1/10 to 2 1/4 in total head length; A. I, 7 or I, 8, first branched ray 3 2/5 to 4; least depth of caudal peduncle 3 1/5 to 3 1/4; pectoral rays I, 13 or I, 14, fin reaches 1/2 to 3/5 in dorsal base; ventral 3 2/3 to 3 7/8 in body from mandible tip to caudal base, reaches beyond base of last anal ray though not to its tip; lower caudal lobe 3 1/10 to 3 1/5 in rest of fish, upper lobe 1 1/3 to 1 1/2 in lower.

Back and upper surfaces brown, sides and below silvery white. Sides of body with coppery brown tinge. Iris

Genus Dampieria Castelnau

Dampieria Castelnau, Philadelphia Centen. Exhib. Offic. Record (Rep. Fishes Australia), 1875, p. 30. Type Dampieria lineata Castelnau, monotypic.

Cichlops (not Hodgson 1844) Müller and Troschel, Horae Ichth., pt. 3, 1849, p. 24. Type Cichlops cyclophthalmus Müller and Troschel, monotypic.

Labracinus Bleeker, Verhand. Kon. Akad. Wet. Amsterdam, no. 5, vol. 15, 1875, p. 2 (name in synonymy). Type Cichlops cyclophthalmus Müller and Troschel, monotypic.

Body oblong, strongly compressed. Head obtuse, convex above. Mouth moderately oblique, curved. Teeth in several rows in jaws, outer row somewhat enlarged. Vomer toothed, palatines edentulous. Preopercle edentulous. Branchiostegals 6. Scales ctenoid, small, about 60 in

brownish to whitish. Dorsal pale brownish, caudal little darker. Anal whitish. Pectoral largely blackish brown above, narrowly along upper edge and broadly along lower portion whitish; folded fin with median rays edged with silvery gray, giving lighter tint to fin medially. Ventral whitish, brownish submarginally in front.

East Indies, Melanesia. An interesting and well marked species, known by the posterior insertion of the ventrals much nearer caudal base than gill opening. Its pectoral is also much more contrasted than the uniform brown pectoral of Bleeker's figure.

12592. Rapurapu Island, Luzon.
June 22, 1909. Length 44 mm.

1 example. Tifu Bay, Boero Island,
Dutch East Indies. December 10, 1909.
Length 40 mm.

24138. Tomahu Island, Boero.
December 12, 1909. Length 46 mm.

1 example. Mabul Island, Borneo.
September 29, 1909. Length 42 mm.

1 example. Limbe Strait, Celebes.
November 10, 1909. Length 35 mm.

4904. Camp Overton, Mindanao. August 5, 1909. Length 223 mm.

8017, 8018. Catbalogan, Samar. April 16, 1908. Length 193 to 215 mm.

Seychelles, East Indies, Philippines, Micronesia, Polynesia. Hawaii.

1 example. Biri Channel. June 2, 1909. Length 54 mm.

2 examples. Cagayan Island, Cagayanes Islands, Jolo Sea. March 31, 1909. Length 38 to 41 mm.

22472. Little Santa Cruz, Zamboanga. May 26, 1908. Length 63 mm.

5732. Mahinog, Camiguin Island. August 3, 1909. Length 53 mm.

1 example. North west Verde Island. July 22, 1908. Length 49 mm.

1 example. Opol, Mindanao. August 4, 1909. Length 36 mm.

21572. Port Galera, Mindoro. October 27, 1909. Length 56 mm.

16542. Port Matalvi, Luzon. November 22, 1908. Length 37 mm.

Cypselurus agoo (Schlegel)

Exocoetus agoo Schlegel, Fauna Japonica, Poiss., pt. , p. 247, 1846 (type locality: Seas of Japan). (Error.)

Exocoetus agoo Bleeker, Verh. Batavia. Genoot. (Japan.), vol. 25, p. 18, 1853 (Agoo). — Ishikawa and Matsuura, Prelim. Cat. Fishes Imus. Tokyo, p. 18, 1897 (reference).

Cypselurus agoo Jordan and Snyder, Annot. Zoöl. Japon., vol. , p. 60, 1901 (Yokohama). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1919, p. 15 (Tsuruga; Yokohama; Miyako). — Jordan and Hubbs, Mem. Carnegie Inst., vol. 10, no. , p. , 1925 ( ). — Schmidt, Trans. Pac. Comm. Acad. Sci. U.S.S.R., p. 35, 1931 (Nagasaki).

Cypsilurus agoo Jordan and Starks, Proc. U. S. Nat. Mus., vol. 26, p. 541, fig. 3, 1903 (Tsuruga, Nagasaki, Tokyo, Myiako, Hiroshima, Habata, Onomichi, Aomori). — Anonymous, Illust. Jap. Aquat. Pl. Animals, vol. 1, pl. 21, fig. 10, 1931.

Exocoetus doderleinii (Steindachner) Steindachner and Döderlein, Denks. Akad. Wiss. Wien, vol. 49, pt. 1, p. 294, 1885 (type locality: Tokyo).

Cypselurus doderleinii Jordan and Snyder, Annot. Zool. Japon., vol. , p. 60, 1901 (Yokohama).

base, 59 or 60 tubular scales in lateral line to caudal base and 9 more on latter; 16 or 17 scales above lateral line to soft dorsal origin, 20 or 21 below, 50 to 57 predorsal scales forward slightly before front nostril. Scales with 5 or 6 basal radiating striae; apical denticles 50 or 51, small, slender points, basal elements in 13 or 14 transverse series; circuli very fine.

D. XII or XIII, 21, I, third spine 2 1/3 to 2 1/2 in head, second ray 3 to 3 2/5; A. III, 7, I, second spine 2 1/8 to 2 1/5, third ray 1 2/3 to 2; caudal 1 1/4, truncate or very slightly emarginate; least depth of caudal peduncle 2 4/5 to 3; pectoral 1 1/5 to 1 1/4; ventral 1 1/5 to 1 1/3.

Depth 5 1/5 to 6 1/4; head 4 1/3 to 4 7/8, width 1 1/2 to 1 4/5. Snout 3 1/3 to 4 1/3 in head from snout tip; eye 3 1/3 to 3 3/4, greater than snout to subequal with age, 1 2/5 to 1 3/5 in interorbital; maxillary reaches 3/5 to 2/3 in snout, length 4 1/8 to 4 3/4 in head; teeth fine, short, conic, very small, in narrow bands in jaws; interorbital 2 2/5 to 2 1/2, broad, shallowly concave. Gill rakers 6 + 15, lanceolate, 1/2 gill filaments, which 1 1/3 in eye.

Scales 50 to 55 in median lateral series to caudal base and 5 to 8 more on latter; 8 to 10 above lateral line, 4 below, 42 to 48 predorsal. Scales with 3 to 5 basal radiating striae, edge scalloped; circuli very fine, complete.

Etelides Jordan and D. G. Thompson, Bull. Bur. Fisher., vol. 24, 1905, p. 241. Type Etelis equilinaris Goode and Bean, monotypic.

Etelinus (Jordan) Jordan and W. F. Thompson, Proc. U. S. Nat. Mus., vol. 39, 1911, p. 465. Type Etelis marshi Jenkins, orthotypic.

Body usually slender, elongate, Back before dorsal broadly flattened to occiput: compressed. Eye large. mouth moderate, lower jaw protruding. maxillary without supplemental bone. Canines in upper jaw only, strong, sometimes absent; no teeth on pterygoids or tongue. Cranium wide, level. Preorbital narrow. No opercular spine. Gill rakers 10 to 15 on lower arch, long, slender. Branchiostegals 7. Scales large, above lateral line parallel with its course. Head naked above. Maxillary scaly or naked. Soft dorsal not scaly.

D. I, 11, I or I, 12, I, first branched ray 1 3/4 to 2 1/10 in total head; A. I, 8, I to I, 11, I, first branched ray 3 to 3 1/2; least depth of caudal peduncle 2 7/8 to 3 2/3; P. I, 15, reaches beyond bases of last dorsal and anal rays, sometimes beyond tips though not to caudal base; ventral little longer than head, reaches fifth anal ray base.

Back brown, sides and under surface whitish to silvery white. Iris silvery white. Dorsal and caudal blownish, former sometimes darker brownish terminally. Pectoral with membranes becoming dark brown terminally. Ventral

Japan.

Genus Etelis Cuvier

Etelis Cuvier, Hist. Nat. Poiss., vol. 2, 1828, p. 127. Type Etelis carbunculus Cuvier, monotypic.

Eteles Swainson, Nat. Hist. Animals, vol. 2, 1839, p. 202. Type Etelis carbunculus Cuvier, virtually, as Eteles Swainson simply different spelling for Etelis Cuvier.

Elastoma Swainson, op. cit., vol. 2, 1839, p. 202. Type Elastoma oculatus Cuvier, monotypic.

Hesperanthias Lowe, Fishes of Madeira, 1843, p. 14. Type Serranus oculatus Cuvier, monotypic.

Macrops (not Wagler 1830) Lunel, Mem. Acad. Sci. Paris (Ichth. Analytique), vol. 27 pt. 1, 1856, p. 279. Type Serranus aculeatus Lunel = Serranus oculatus Cuvier, monotypic.

U. S. N. M., No. 22540. Japan. Japanese Government. Length 444 mm.

U. S. N. M., No. 44931. Japan. Japanese Government. Length 398? to 405 mm. Two examples.

U. S. N. M., No. 50736. Tokyo. D. S. Jordan and J. O. Snyder. Length 270 to 310 mm. Four examples.

U. S. N. M., No. 50737. Tsuruga, Echizen. Length 230 to 258 mm.

U. S. N. M., No. 53535. Yakushima, Kagoshima, Japan. June 3, 1905. Robert Anderson. Length 320? mm.

U. S. N. M., No. 57634. Japan. P. L. Jouy. Length 270? mm.

U. S. N. M., No. 57635. Japan. P. L. Jouy. Length 245 to 260? mm. Three examples.

U. S. N. M., No. 57636. Japan. P. L. Jouy. Length 230 to 245? mm. Two examples.

1 3/4 in eye.

Scales 48 to 50 in lateral line, 6 6 counted along above lateral line, 5 6 counted along below; 11 or 12 scales above lateral line, 18 or 19 below, predorsal 47 extending little forward of nostrils, 22 rows on cheek of which 6 on preopercle flange. Scales with 8 to 12 basal radiating stride, apical denticles 45 or 46, slender, with 7 or 8 transverse series of basal elements; circuli fine.

D. XI, 15 or 16, fourth spine 2 1/10 to 2 1/4 in head, fifth ray 2 1/10 to 2 1/4; A. III, 9, second spine 2 2/3 to 4 3/5, third ray 2 1/5 to 2 1/4; caudal 1 3/5 to 2, convex behind; least depth of caudal peduncle 2 7/8 to 3; pectoral 1 2/5 to 2, ventral 1 1/2 to 1 3/4.

A. H. A. P., No. 31716 to 31718. Tsuruga, Japan. Stanford University. In exchange. Length to mm. Three examples.

A. H. A. P., No. 28240 to 28241. Yokohama, Stanford University. In exchange. Length to mm. Two examples.

A. H. A. P., No. 31735. Imiyaho. Stanford University. In exchange. Length mm.

1196

...darker; lower ... yellow spots
...of scales silvery with some dusky, bordered with
...le olive yellow; breast washed with yellowish; side
...with pearly reflections; bright prussian blue on
...al beginning near ~~the~~ corner of mouth, ~~where~~ line
...rely indicated by spots; serrated edge of pre-
...hite, without membrane; inside of jaws chinese
dorsal olive, becoming madder brown posteriorly,
margined with yellow; caudal brown, ~~the~~ rays dusky
upper lobe yellow; anal yellow, narrowly margined
...te: paired fins yellow, ~~the~~ fount of ventral white;
...hyaline; iris dark, with some silver.

of 45

Cypselurus nigripennis (Valenciennes)

Exocoetus nigripennis Valenciennes, Hist. Nat. Poiss., vol. 19, p. 108, 1846 (type locality: China Seas). — Bleeker, Verh. Batavia. Gen. (Knock.), vol. 24, p. 27, 1852 (Pinang); Act. Soc. Sci. Ind. Neerl., No. 7, vol. 2, p. (8) 86, 1857 (Amboina); Naturk. Tijds. Nederl. Indië, vol. 22, p. 99, 1860 (New Guinea).

? Exocoetus nigripinnis Bleeker, Nederl. Tijds. Dierk., vol. 3, p. 120, 1866 (Singapore; Amboina). — Günther, Cat. Fishes Brit. Mus., vol. 6, p. 298, 1866 (part). — Bleeker, Atlas Ichth. Ind. Neerl., vol. 6, p. 70, pl. (5) 251, fig. 1, 1866-72 (Singapore; Pinang; Amboina; New Guinea); Versl. Akad. Wet. Amsterdam, ser. 2, vol. 2, p. 272, 1868 (Gnebe, Moluccas). —

New Guinea

Macleay, Proc. Linn. Soc. New South Wales, vol. 5, pt. 2, p. 188, 1881 (Western Australia; Warrior Reef). — Savage,

Hist. Nat. Madagascar, Poiss., p. 526, 1891 (name). — Steindachner, Abhandl. Senckenberg. Ges., vol. 25, p. 452, 1900 (1901) (Ternate). — Duncker, Mitteil. Naturh. Mus. Hamburg, vol. 21, p. 171, 1903 (1904) (compiled).

Exocoetus nigripinnis Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 350, 1876 (Warrior Reef; error).

↑ Exocoetus nigripinnis Saville Kent, Great Barrier Reef, pp. 299, 370, 1893 (Queensland).

Specimens).

Cypselurus nigripennis Fowler, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Shortland Island).

Hist. Nat. Madagascar, Poiss., p. 526, 1891 (name). — Steindachner, Abhandl. Senckenberg. Ges., vol. 25, p. 452, 1900 (1901) (Ternate). — Duncker, Mitteil. Naturh. Mus. Hamburg, vol. 21, p. 171, 1903 (1904) (compiled).

Exocoetus nigripinnis Alleyne and Macleay, Proc. Linn. Soc. New South Wales, vol. 1, p. 350, 1876 (Warrior Reef; error).

Cypsilurus nigripennis Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 192, 1922 (Bleeker's specimens).

Cypselurus nigripennis Fowler, Mem. Bishop Mus., vol. 10, p. 84, 1928 (Shortland Island).

Depth 4 2/3 to 5 1/4; head 3 7/8 to 4 1/4; width 1 1/3 to 1 2/5. Snout 3 1/4 to 4 in head from snout tip; eye 2 7/8 to 3, much greater than snout, 1 1/3 to 1 2/5 in interorbital; maxillary reaches front edge of iris; length 3 1/2 to 3 3/4 in head from snout tip; teeth as very minute points along edges of jaw; interorbital 1 7/8 to 2 in head from snout tip, broad, shallowly concave. Gill rakers 6 + 17, lanceolate, 1 1/2 in gill filaments, which 1 1/2 in iris.

Scales estimated about 38? in lateral or axial series to caudal base and 4 more on latter, little developed and most all now fallen.

D. I, 10 or I, 11, second branched ray 1 4/5 to 2 in total head length;

Pseudogramma polyacantha (Bleeker)

Pseudochromis polyacanthus Bleeker, Nat. Tijds. Ned. Indie, vol. 10, 1856, p. 375. Ternate. — Günther, Cat. Fishes Brit. Mus., vol. 2, 1860, p. 258 (copied). — Kner, Sitzg. Ber. Akad. Wiss. Wien, vol. 56, 1867, p. 717 (Fiji). — Schmeltz, Cat. Mus. Godeffroy, no. 4, 1869, p. 16 (Viti Islands); no. 5, 1874, p. 26 (Viti Islands). — Günther, Journ. Mus. Godeffroy, vol. 5, pt. 11, 1876, p. 159, pl. 98, fig. A (Tahiti; Raiatea). — Fowler, Proc. Acad. Nat. Sci. Philadelphia, 1900, p. 523 (Tahiti); Occas. Pap. Bishop Mus., vol. 8, no. 7, 1923, p. 384 (Honolulu); Mem. Bishop Mus., vol. 10, 1928, p. 189 (Honolulu; Marcus Island; Tahiti).

A. I, 7, first branched ray 1 7/8 to 2; least depth of caudal peduncle 3 to 3 1/2; pectoral rays I, 13, uppermost or simple ray short and separated from rest of fin by broad membrane, fin reaching about middle of dorsal base, ventral half of body without caudal, reaches caudal base; lower caudal lobe 2 1/8 to 3 1/4 in rest of body, upper lobe 1 2/5 to 1 2/3 in lower lobe.

Pale brown generally, under surface with silvery sheen punctuated with deep or dusky brown. Dark brown blotch below each eye. Vertical fins whitish; dorsal terminally above with dusky blotch; caudal with gray blotch terminally on lower lobe;

Pseudogramma polyacanthus Bleeker, Verh. Kon. Akad. Weten. Amsterdam, no. 5, vol. 15, 1875, p. 24, pl. 3, fig. 2 (Ternate; Timor); Atlas Ichth. Ind. Néerl., vol. 9, 1877, pl. (1) 389, fig. 3. — Steindachner, Abhandl. Senckenberg. Gesell., vol. 25, 1900, p. 428 (Batjan; Ternate). — Bryan and Herre, Occas. Pap. Bishop Mus., vol. 2, no. 1, 1902 (1903), p. 139 (Marcus Island). — Regan, Trans. Linn. Soc. London, series 2, vol. 12, 1905, Zool., p. 327 (Amirante, Seychelles, in 25 to 35 fathoms). — Beaufort, Bidrag. Dierk. Amsterdam, pt. 19, 1913, no. 9, p. 119 (Amboin). — Weber, Siboga Exped., vol. 57, Fische, 1913, p. 266 (Lamakera; Kabaka).

Pseudograma polyacantha Fowler, Bull. Bishop Mus., no. 22, 1925, p. 37 (Tahiti).

another paler and smaller medially, besides still third basally; at base of upper caudal lobe short oblique well contrasted blackish bar. Paired fins largely blackish, though pectoral usually, or at least in largest specimen of series show whitish transverse band at basal third of fin; also one or more large darker nebulous areas or blotches on remaining outer portions of fin.

Penang, Singapore, East Indies, China, Western Australia, Melanesia.

Compared with Bleeker's rather crude figure of Exocoetus nigripinnis my specimens differ in many ways. He shows the vertical fins blackish, though the caudal with a slightly paler oblique bar from the base of

midway in interorbital, 14 or 15 rows obliquely across cheek to preopercle edge. Maxillary scaleless, also preorbital, infraorbitals, snout and mandible. Scales with 11 basal radiating striae; circuli moderate.

D. VII, I, 19, third spine 3 7/8 to 4 in total head length, twelfth ray 2 3/5 to 3; A. III, I, 15, second spine 4 1/8 to 4 3/4, tenth ray 2 2/3 to 2 4/5; caudal 1 3/5 to 1 2/3, convex behind; least depth of caudal peduncle 3 to 3 1/2; pectoral 1 2/5 to 1 1/2; ventral 2 1/2 to 3.

Brown, scarcely paler below, with 6 ill defined or obscure darker vertical bands on trunk and tail. Dusky brown blotch, but little smaller than eye, on opercle. Vertical fins all more or less dusky. Paired fins pale. Iris dusky.

the upper lobe down to the lower lobe; the position of the ventral fin also more advanced so the depressed fin would fall well short of the caudal base. The white pectoral band of some of the larger young specimens seem to suggest the possibility of the identity of Cypselurus arcticeps.

Exocoetus nigripennis Valenciennes is described with D. 12, A. 10, paired fins black, caudal yellowish, body above brown, below white. Length 88 mm.

Depth 3 to 3 1/5; head 2 1/2 to 2 2/3, width 1 3/5 to 1 7/8. Snout 4 to 5 in head from snout tip; eye 4 to 4 1/3, greater than snout or interorbital; maxillary reaches well beyond eye, less so in young, expansion 1/5 to 1/4 in eye, length 1 7/8 to 2 in head from snout tip; teeth fine, small, in narrow bands in jaws, on vomer and palatines, none on tongue; interorbital 7 to 13, depressed or nearly level. Gill rakers 4+9, short, robust, equal gill filaments or 1/3 of eye.

Scales 36 to 40 in median lateral series between head and caudal base and 8 or 9 more on latter; 22 to 28 tubular scales in lateral line, which ends opposite middle of soft dorsal base; 5 scales above lateral line, 19 or 20 below, 32 to 34 predorsal forward

One example. D. 5539. Apo Island (C.), N. 78° W., 8.2 miles (lat. 9° 3' 20" N., long. 123° 24' 45" W.), between Negros and Siquijor. August 19, 1909. Length 36 mm.

Two examples. D. 5540. Apo Island (C.), N. 76° W., 8.1 miles (lat. 9° 3' 00" N., long. 123° 24' 30" E.). August 19, 1909. Length 26 to 28 mm.

One example. Lat. 25° 10' N., long. 166° 20' W. November 3, 1907. Length 19 mm.

Forty-one examples. D. 5561. Teomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5° 50' 45" N., long. 121° 1' 15" E.), Jolo Island vicinity. September 19, 1909. Length 20 to 58 mm.

Eight examples. Kowloon, China. Electric light. September 14, 1908. Length 28 to 45 mm.

Cypselurus brevis Weber and Beaufort

Cypselurus brevis Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 192, 1922 (type locality: Saleyer; Aru Islands).

Depth 4 to 4 1/2; head 3 9/10 to 4. Snout somewhat shorter than eye, upper profile gently sloping downward in straight line from eye to snout tip; eye 3; slightly less than postorbital which equals interorbital; teeth minute, conic, several rows in jaws, none on palate.

Scales 49 to 52 in lateral series; 8 above, 3 below, 27 predorsal.

D. 12 or 13, distant from first rudimentary caudal rays space little more than head length; A. 9, origin below sixth dorsal ray; caudal deeply forked; pectoral rays I, 14; ventral rays 6, reach middle of anal, longer than head, origin midway between hind preopercle edge and caudal

base..

Darks above, silvery below. Dorsal and caudal dusky. Anal and ventrals white with outer rays of latter somewhat dusky. Pectoral dusky above, hyaline below, reddish brown in axis. Length 256 mm.

East Indies. Weber and Beaufort say "allied to C. bahiensis and C. oligolepis, from both of which it differs through the absence of teeth on the palate. It is moreover distinguished from C. bahiensis by its greater height, smaller teeth, less blunt profile of snout, and from C. oligolepis by its simple, not tricuspid teeth and smaller scales."

Eteira taurnagi Kaup, Arch. Naturges., (du Luoy and Gaimard).
band 26, abth. 1, 1860, p. 148
Chaetodon triangularis Rüppell, Atlas
Reise. nördl. Afr., Fisch., 1828, p. 42, plate
9, fig. 3. Tor, Red Sea.
Eteira triangularis Kaup, l.c., p. 147.
Chaetodon trifascialis Cuvier, Règne
Animal, ed. 2, vol. 2, 1829, p. 190. Guam.
(du Chaetodon trifascialis Quoy and
Gaimard.)
Megaprotodon trifascialis Quichenot, Rev.
Zool., 1848, p. 12.
Chaetodon triangulum (non Cuvier 1831,
p. 34) (Reinwardt) Cuvier, Hist. Nat.
Poiss., vol. 7, 1831, p. 44. Moluccas. (name
in text.)
Chaetodon leachii Cuvier, l.c., p. 37. No
locality. — Günther, Cat. Fish. Brit. Mus.,
vol. 2, 1860, p. 6 (copied).

Cypselurus gilberti (Snyder)

Exonautes gilberti Snyder, Bull. U. S. Fish Comm., vol. 22, 1902, p. 522, pl. 7, fig. 13 (1904) (type locality: near lat. 28½° N., long. 140° W., north east of Honolulu). — Jordan and Evermann, Bull. U. S. Fish Comm., vol. 23, pt. 1, p. 134, pl. 24, 1903 (1905) (type). —

Jordan and Dickerson, Proc. U. S. Nat. Mus., vol. 34, p. 607, 1908 (note).

Cypsilurus gilberti Jordan and Seale, Bull. Bur. Fisheries, vol. 25, p. 209, 1905 (1906) (reference).

Exocoetus gilberti Günther, Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 371, 1909 (copied).

Cypselurus oxycephalus (not Bleeker) Fowler, Occ. Bishop Mus., vol. 10, p. 81, 1928 (type of Exonautes gilberti).

Depth 7; head 4 3/4, width 1 2/3. Snout 4 7/8 in head from snout tip; eye 3, greater than snout, 1 1/5 in interorbital; maxillary reaches 3/4 to eye, length 4 1/8 in head from snout tip; teeth minute, simple, in narrow band in each jaw, narrower posteriorly or at sides of jaw; interorbital 2 1/2, broad, shallowly concave. Gill rakers 7+ 18, lanceolate, subequal with gill filaments or 1/2 of eye.

Scales 48 from above gill opening to caudal base and 6 more on latter; 6 above, 3 below, 36 predorsal. Scales with 5 or 6 basal radiating striae, edge scalloped; circuli very fine, complete.

D. I, 9, I, first branched ray 1 4/5 in total head length; A. I, 9, first

of the type. Others may be well established species but not represented in our collections. In all such cases both descriptions and figures are utilized in framing the descriptions for this report, as well as duly credited.

I have also included an examination of the installed materials of the present families in the general series of fishes in the United States National Museum, also such type specimens as may be involved. Similar materials in the Academy of Natural Sciences of Philadelphia are included in the same way.

In securing the services of Mr. Richard Blossom Farley for preparing the illustrations I feel fortunate in being able to present accurate and

branched ray $2\frac{2}{3}$; least depth of caudal peduncle $3\frac{2}{3}$; pectoral rays II, 16, fin reaches beyond dorsal and anal, though not quite to caudal base; ventral reaches little beyond base of seventh anal ray; lower caudal lobe $3\frac{2}{5}$ in rest of body; upper caudal lobe $1\frac{1}{8}$ in total head.

Olive brown on back and above, sides below and under surfaces silvery white. Iris silvery white, also mandible. Dorsal and caudal brownish, or like back. Anal whitish. Pectoral largely dusky, rays outside basally pale, fin terminally blackish, though its lower hind edge narrowly pale. Ventral brownish medially, greater inner edges whitish.

Lutjanus, new subgenus ---------- 4
Lutjanus. ----
Lutjanus palmeri, new species.
Macolor vermicularis, new species.

In Pomadasyidae:
Hirolabrichthys watsi, new species.
Ctenoscolopsis, new subgenus ------
---- Scolopsis.
Pomadasyina, new subgenus ---------
---- Pomadasys.

In Theraponidae:
Leiopotherapon, new subgenus ------
---- Therapon.
Rhynchopelates, new subgenus -----
---- Pelates.

All the Indo-Pacific species known, pertaining to the families studied in this report, are included. Frequently some are only known from the original description, or perhaps a subsequent examination or figure

Hawaiian Islands. This species is closely related to Cyprselurus rondeletii in having its first 2 pectoral rays simple. That species differs, however, in having 12 or 13 anal rays.

type.
U. S. N. M., No. 50872, 1, Lat. 26° 50' N., long. 140° W. Albatross Collection (249). Length 265 mm.

In Pseudochromidae the following are described as new:

Lampieria melanostigma, new species.

Bartschina, new subgenus - - - - - - - - -

- - - - Lampieria.

Lampieria bitaeniata, new species.

Agilbyina, new subgenus - - - - - - - - - -

- - - - Lampieria.

Devisina, new subgenus - - - - - - - - - -

- - - - - Pseudochromis.

Klausingerina, new subgenus - - - - - - - -

- - - - Pseudochromis.

Pseudochromis splendens, new species.

Pseudochromis polynemus, new species.

Pseudochromis moorei, new species.

In Pempheridae:

Pempheris itoi, new species.

In Lutjanidae:

Cypselurus naresii (Günther)

Exocoetus naresii Günther, Rep. Voy. Challenger, vol. 31, p. 36, pl. 1, fig. a, 1888 (1889) (type locality: between Fiji and New Hebrides); Journ. Mus. Godeffroy, vol. 8, pt. 16, p. 365, 1909 (type). — Weber, Siboga Exped., vol. 57, Fische, p. 128, 1913 (between Gebe and Tau).

Cypselurus naresi Weber and Beaufort, Fishes Indo Austral. Archip., vol. 4, p. 188, 1922 (Weber's material).

Cypselurus naresii Fowler, Mem. Bishop Mus., vol. 10, p. 84, 1928 (copied).

Depth 5 2/3 to 6 2/3; head 3 2/3 to 3 3/4, width 2 to 2 1/10. Snout 4 to 4 2/5 in head from snout tip; eye 3 to 3 1/5, much greater than snout, 1 1/4 to 1 1/3

in interorbital; maxillary reaches 4/5 or to eye, length 3 1/2 to 4 in head from snout tip; mandibular barbel 2 2/5 to 2 3/5 in body with caudal, broad, band like; teeth scarcely evident; interorbital 2 2/5 to 2 4/5 in head from snout tip, broad, nearly level. Gill rakers 5+ 14, lanceolate, slender, 1 1/4 in gill filaments, which 2 1/2 in eye.

Scales 37 or 38 in lateral or axial series to caudal base and 4 more on latter, estimated from

pockets (all scales now fallen);
24 predorsal.

D. I, 10, second branched ray ½ in total head length; A. I, 7, first branched ray 1 7/8 to 2; least depth of caudal peduncle 3 to 4 1/5; pectoral rays I, 11 to I, 13, fin reaches 1/2 to 7/8 in dorsal base; ventral reaches 2 1/3 to 2 3/5 in space between mandible tip and caudal base, extends slightly beyond caudal base; lower caudal lobe 3 2/5 to 3 2/3 in rest of body, upper caudal lobe 2 in lower lobe.

Brown above, sides whitish and under surface grayish dusky, soiled or darker on belly. Iris silvery gray. Band like barbel blacks with narrow white

dorsal spines and interrupted lateral line. Found chiefly in the Indian Ocean and Malaysia.

Analysis of the Genera

a.' Pseudogramminal. Scales ctenoid, moderate or about 50 in lateral series; palate with teeth; dorsal spines 7, stout; anal rays 16 or 17. Pseudogramma

a.² Pseudochrominal. Scales ctenoid; palate usually with teeth; dorsal, anal and ventral with spines, first with only 2 or 3 spines; anal rays 13 or 14.

b.' Teeth on vomer, none on palatines; scales small, about 60 in lateral line. Lamprichthys

b.² Teeth on vomer and palatines; scales moderate or large, 32 to 45 in lateral series.

c.' Soft dorsal and anal with most rays branched; ventral rays branched, moderate.

midrib. Vertical fins whitish. Dorsal grayish terminally. Caudal with faint gray blotch at end of lower lobe, another medially and third basal, also dusky black area at base of upper lobe. Pectoral with upper and lower edges whitish, medially blacks. Ventral blacks, edges paler.

East Indies, Polynesia. Günther's specimen was 175 mm long. Fish description and figure agree in most all details, though the last dorsal and anal rays are said to be blackish.

Six examples. D. 5561. Tomabal Island (NW.), S. 36° W., 0.2 miles (lat. 5°50'45" N., long. 121°1'15" E.), vicinity of Jolo. September 18, 1909. Length 23 to 64 mm.

Genus Pseudogramma Bleeker

Pseudogramma Bleeker, Verh. Akad. Wet. Amsterdam, No. 5, vol. 15, 1875, p. 24. Type Pseudochromis polyacanthus Bleeker, monotypic.

Body oblong, compressed. Head acute. Mouth oblique, cleft not curved. Maxillary reaches slightly beyond hind eye edge. Teeth in several series in jaws, none canine like; vomer and palatines toothed. Preopercle armed with small spine above. Branchiostegals 6. Scales ctenoid, moderate, 50 in lateral series. Jaws and cheeks scaly. Dorsal and anal bases scaly. Dorsal with 7 pungent spines and 19 to 21 rays; membranes of spinous fin notched. Anal with 3 spines and 16 or 17 rays. Ventrals inserted below pectoral bases, each with 5 rays, second ray longest.

Cypselurus spilurus (Günther)

Exocoetus spilurus Günther, Cat. Fishes Brit. Mus., vol. 6, p. 285, 1866 (no locality).

Cypsilurus spilurus Klumeker and Mohr, Mitteil. Zool. Mus. Hamburg, vol. 42, p. 128, figs. 1-3, 1926 (east Long Island, New Guinea).

Cypselurus spilurus Fowler, Mem. Bishop Mus., vol. 10, p. 85, 1928 (compiled).

Single flat barbel at chin, half as long as head. D. 11, fin moderately elevated, last rays reaching caudal; A. 8; pectoral extends to ventral root; ventral reaches caudal, origin midway between head and caudal root. Upper parts transparent, colorless, lower parts brown. Small black spot at base of

Depth not more than head length, which short and thick. Snout very short; eye very large; interorbital space wide, concave.

barbel, larger one in middle of ventral root. Upper part of gill opening black. Pectoral colorless, with triangular black spot at base. Ventral and anal fins black. Length 63 mm.

(Günther.)

East Indies. Bleeker and Inoher have figured two examples, 32 and 17 mm long.

Batu, Nias, Java, Flores, Volor, Timor, Halmahera, Ternate, Obi major, Buru, Ceram, Amboina, Banda, New Guinea).

Gnophaetodon triangulum Jordan and Seale, Bull. Bur. Fisher., vol. 26, 1906 (1907), p. 33 (Philippines). — Jordan and Richardson, l.c., vol. 27, 1907 (1908), p. 269 (Cayayancillo). — McCulloch, Records Austral. Mus., vol. 15, no. 1, 1926, p. 36 (Pearl Reef, Queensland; Papua, New Hebrides, Solomons, New Britain).

Chaetodon baronessa Cuvier, Hist. Nat. Poiss., vol. 7, 1831, p. 34 (45) (on Banning, Renard, Valentyn). — Günther, Cat. Fish. Brit. Mus., vol. 2, 1860, p. 31 (Moluccas, Amboina, Ceram, Java). — Meyer, Ann. Soc. Espan. Hist. Nat. Madrid, vol. 14, 1885, p. 17 (Manado, Celebes).

Chaetodon triangulum subsp. baronessa Ahl, Arch. Naturges., band 89, abth. A, heft 5, 1923, p. 175, plate 7, fig. 11 (Ralum, New Guinea, New Pommerania, Bougainville, Amboina).

Cyprelurus caudimaculatus new species

Depth 6 1/2 to 6 7/8; head 4 1/5 to 4 1/3, width 1 3/5 to 1 3/4. Snout 3 1/5 to 4 in head from snout tip; eye 3 1/8 to 3 1/4, greater than snout, 1 1/2 in interorbital; maxillary reaches 3/4 or to eye, length 3 4/5 to 4 1/8 in head from snout tip; teeth very minute, simple, conic, in narrow bands in jaws; bifid barbel at symphysis of mandible long as eye; interorbital 2 1/3 to 2 2/5 in head from snout tip, broad, shallowly concave. Gill rakers 6+17, lanceolate, 1 1/2 in gill filaments, which 1 2/3 in eye.

Scales 39 to 42 in median lateral series to caudal base and 4 more on latter, mostly fallen and counted largely from pockets; 27 or 28 predorsal to occiput. Scales with 2 or 3 basal radiating strial, edge scalloped; circuli 16 to 22, complete.

D. I, 8 to I, 10, seventh ray 1 2/5 to 2 in = total = head length; A. I, 6 or I, 7, first branched ray 2 to 2 1/8; least depth of caudal peduncle 3 1/8 to 3 3/5; P. I, 13, fin reaches 1/8 in ventral or 2 1/10 to 2 1/3 in total length to caudal base; ventral inserted little nearer caudal than gill opening, reaches slightly beyond caudal; lower caudal lobe 4 1/8 to 4 1/4 in rest of fish, upper lobe about half of ~~fish~~ lower.

Back brown, belly and under surfaces dusky to smutty, often with grayish cast. Head often dusky coppery below. Iris gray or coppery silvery. Dorsal pale, dusky to blackish posteriorly, also anal. Anal white, with medial basal blackish blotch. Pectoral whitish, with black basal blotch and larger one terminally. Ventral black. Barbel blackish.

Diagnosis. Suggestive of Cypselurus nigripennis (Valenciennes) but that species without barbels and its fins largely blackish. Known from most small flying fish by the black basal spot on its pale caudal. It somewhat suggests Exocetus spilurus (Günther, though it is described with "a single flat barbel at the chin, half as long as the head" and with different coloration.

Type. — U. S. N. M., No.

Eight examples. D. 5561. Tomabal Island (NW.), S. 36° W., 0.2 mile (lat. 5°50'45" N., long. 121°01'15" E.), Jolo Island and vicinity. September 19, 1909. Length 47 to 62 mm. Type, 75 mm.